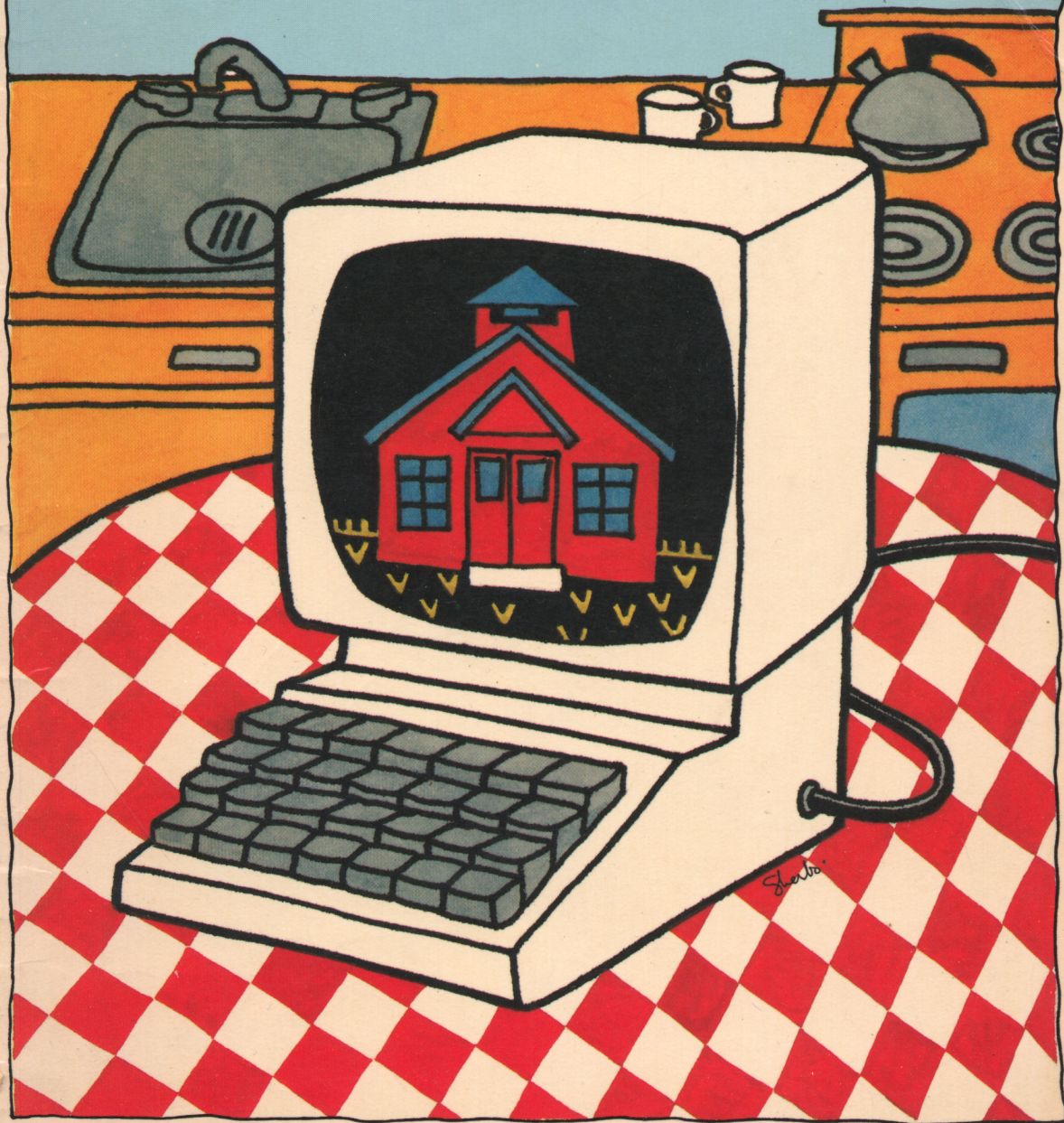
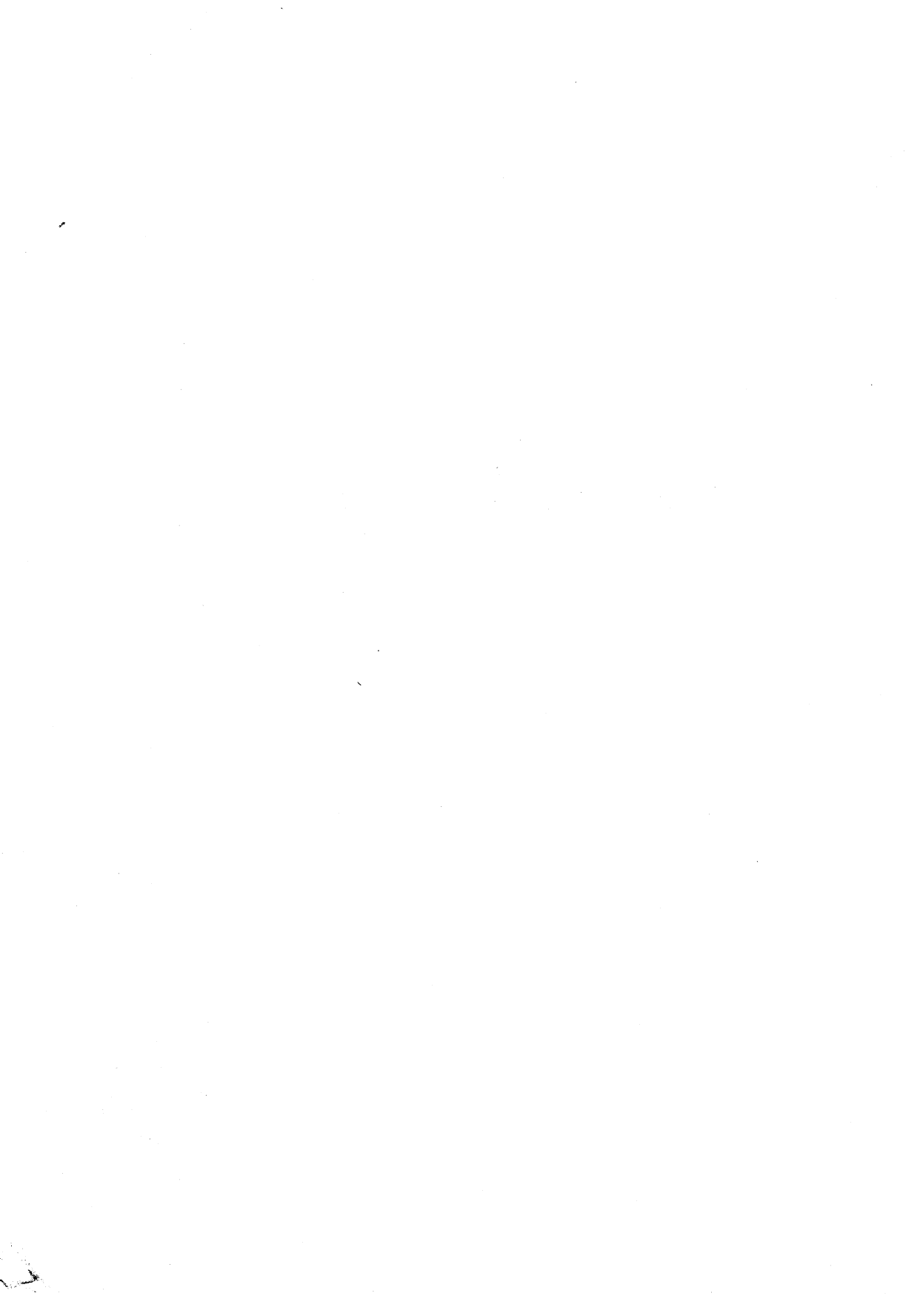


Buy a School for Your Home



Judy Lower with Ed Neil and Tim Finger

Buy a School for Your Home



Buy a School for Your Home

by Judy Lower,
with Ed Neil and Tim Finger



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To The Reader

Buy a School for Your Home is designed to help parents enhance the education of their children at home through the aid of a home computer. In reading this book you will learn how to select computer software and hardware; you will see the role arcade-type games and adventure games play in the learning process; and you will understand how basic educational skills can be taught and strengthened through computer programs. As an aid to confused consumers, we have evaluated 100+ programs now on the market.

Because of the large number of home computers available, and the corresponding thousands of computer programs available, we had to narrow this project and focus on one computer. Due to its wide acceptance by the home user, and to the glorious selection of its software designed for kids, we chose the Atari.

Buy a School for Your Home, therefore, deals with the ATARI 400™ or ATARI 800™ home computer. We confined ourselves to that Atari software designed for the pre-school through sixth grade level.

Many of these programs will be enjoyed far beyond junior high, though. In creating this book we had the assistance of hundreds of parents, teachers, and fantastic kids who reviewed software for us. Our playtesters were having such a good time, had it been left up to them this book would never have been published. They didn't want the fun of reviewing computers to stop. We hope their loss is your gain.

INTRODUCTION

Dragon Thoughts

by Laran Stardrake

Laran Stardrake was born out of a magical encounter between two dragons. When they met, a spell bound them together. They emerged as a third creature by the name of Laran Stardrake. Laran now writes books and software for kids, using the powers of the two dragons and the magic of their combined energies.

A wise dragon once said, "School is everywhere and learning is something you can learn to do." That is what this book is about: learning to learn.

We are writing this book because we want to encourage you, the parents and teachers of our children, to help kids to learn. We are writing this book because we believe in kids! Above all, we believe in the power, beauty, and potential of kids. We also believe that:

- Helping kids learn to help themselves will bring forth a better world.
- Kids determine the future. They are the future.
- We are in new times, changing into even newer times.
- The present cannot be fully understood by looking only to the past.
- Within a few years nearly everyone will have a small computer in the home.

As you will discover in this book, we also believe that learning can be fun. We believe that games and recreational products can be viewed as learning tools for kids to explore the "worlds of if."

A Modest Projection

Everything we are saying about learning in the future, and everything you will discover in this book, may be short of what will really happen in the future. Even much of what you may read about specific products and suggestions for using those products in learning environments may be obsolete by the time you read this book.

The world of technology moves quickly. Most of us now experience more change in five years than some people in the past knew in a lifetime. The one constant in our lives and in our children's future appears to be change.

So, Why This Book?

Because, until now, it was not possible to propose adequately a real shift in the educational system. Also, until now there were no real choices. Pioneers, like Ivan Illich and John Holt, have laid the philosophical groundwork for a shift. The widespread proliferation of low cost learning technologies now make the shift real for millions of people.

If you like most of what schools are about, the advent of learning technologies makes it now possible for you to enhance adequately what they do.

If you don't like today's schools, this book will show you some initial steps in putting a school in your home, your block, your neighborhood. We encourage you to meet and share with the people around you.

Best of all, you can now explore learning as an individual adventure for yourself, your family, your friends and neighbors.

Our children own the future. Help them claim that right with all its possibility and responsibility.

Part I

1

Increase Your Learning Power

by Laran Stardrake

"Those who draw a distinction between education and entertainment don't know the first thing about either."

—Marshall McLuhan

Learning is more than just what goes on in a school classroom nine months out of a year. Learning covers all the knowledge and understanding we gain through reading or observing or experiencing. Learning is discovery; learning occurs everywhere. All of us are learning all the time.

If you've ever watched wild animals, whether it be in the jungle or through the medium of a *National Geographic* special, you will see how wilderness creatures teach their young survival skills through what appears to be exercise and play.



Human animals may have evolved, but we still begin teaching our young in the same manner. When our children are preschoolers, we exercise their bodies and play games with them to help prepare them for the world of their future. We tell them “One, two, buckle my shoe . . .” to teach them numbers; we sing the alphabet so they can easily learn letters. We tell them stories and fables that let them know our values and the understood values of the society in which they will live and grow. We give them toys that help mirror the world around them. We encourage them to play games of “let’s pretend,” or show them how to play the guitar like Daddy or plant vegetables like Mommy.

Why, then, do we stop teaching our children when they start school? It’s usually gradual; it’s mostly unconscious, but by the time our kids are snugly settled in the primary grades, we turn over the “teaching” to the teachers, and expect that the chore of learning will only occupy the school day.

But learning is not a chore. It is an exciting process that continues throughout a lifetime. And learning, as we have said, goes on all the time—whether behind classroom doors or not.

With the changes that have come about in the past few years and through low-cost technology, more opportunities for learning are available than ever before, and they are available right in our own living rooms.

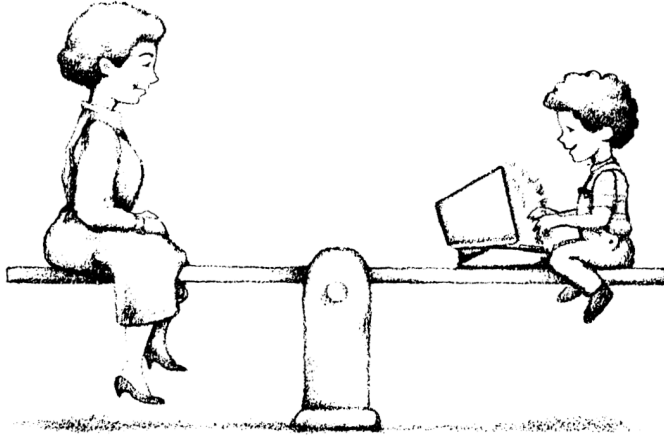
Through the use of a home computer, the entire family can learn almost anything—from the mundane to the most esoteric subjects, once reserved for high-level academia.

Today computer software is in its infancy. However, there is already a bewildering array of games and programs on the market designed for the personal computer. Through *Buy a School for Your Home*, we hope to suggest to parents and teachers that the best use for the home computer is as a tool for learning. And we hope to point out the elements a parent can look for in selecting the software that best enhances the learning process.

WHY COMPUTERS?

The computer offers an adult and a child the opportunity to interact on a near equal basis. There are not many situations or products for which this is applicable.

The computer lets each bring a set of skills to the interaction. Since most adults know something about the workings of a typewriter, they can assist the child in learning where the keys are located, and in applying problem-solving skills to the learning process. Kids provide enthusiasm, fearless-



The computer offers an adult and child the opportunity to interact on a near equal basis.

ness, and an uncanny ability to absorb information when they are challenged to learn.

Since using computers is a fun activity, kids will spend a great deal of time learning. Educators who are concerned about “short attention spans” should see kids who can only be pulled away from computer games grudgingly. When the content of the games is rich, the kids will be learning much.

Computers provide something that kids and parents, or kids and teachers, can do *together*. A great deal of education and parental interaction with kids often seems to be something done *to* kids, rather than something that is done *with* them. Whether it be the challenge of a game, the solving of a puzzle, or the estimation of a computation, the computer seems to magnify the body and mind of a child, making her or him the peer of any attending adult.

WHAT IS SCHOOL?

School is a place to put kids when they are not at home. School is a place where parents expect kids to learn the basic skills, the three R’s. School, fortunately, is a place where kids can be with other kids.

In a sense, school is the life of a child. When kids come home, they are often asked what they did in school. Children may relate rich mixtures of relationships and events that make up their school day. They may tell about their friends, sports activities in which they participated, accomplishments in their music lessons, and, occasionally, about peak learning experiences involving the three R’s.

We say *occasionally*. Why? A kid seldom comes through the door at home saying, “Wow! I really learned something neat about long division today.” The content, the stuff that kids ostensibly go to school to learn, is not a kid’s usual topic of conversation. If forced to discuss the content of a school day, the child usually reverts to talking about grades. Talk of grades substitutes for a re-creation of the learning experience. There is little wonderment of learning when a kid talks about school.

Alas, home is where homework must be done. Even the name of the activity undermines the process of learning. It is called *work* and not *discovery* or *learning* or any of the other names it might be called. Therefore, the extension of school into the home becomes negatively reinforced. Homework is something undesired but endured by the kid, and enforced by the parent because someone says it must be done. Frequently, homework is used as punishment.

We are not saying there are not good schools, motivated and creative teachers, and parents who foster joyful learning. We are saying that today’s “education” is too mechanical, that it stresses the acquisition of facts at the expense of skills, techniques, thinking and creativity. Parents, teachers and kids rightly harbor a vague discontent with schools as they are; this discontent is expressed in a number of ways. The more vocal of these people seek remedies in phrases like “back to basics,” which ignore how much the world is changing. Much of what was basic in the late nineteenth century is useless in the high-technology times of our late twentieth century.

Where is school (or learning, or education) headed that prompts us to talk about “buying” a school for the home?

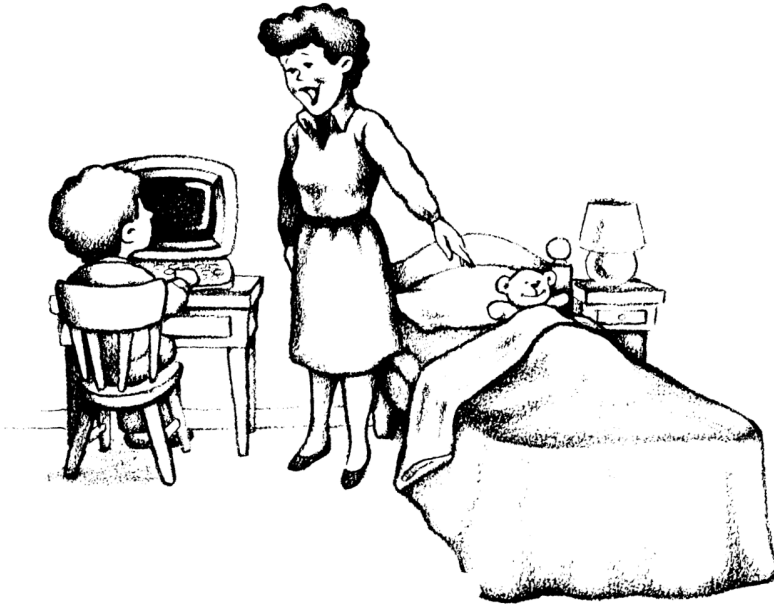
FUTURESCHOOL?

Some people seek to remediate or enhance what takes place in school by hiring tutors, by moving the kids to private schools, by finding and buying learning aids, and, if there is time, by working with the child directly.

These people are the “enhancers.” They strive to enhance what they already find within the schools. They may not be dissatisfied with all that the school offers, perhaps only a part. We see the “enhancers” as the first to bring school into the home, with the help of microtechnology.

Does a school in the home mean that schools as we know them, outside the home, will eventually disappear? No. But the old-fashioned schools will have to adapt, to change. Perhaps schools of the future will be mostly social: where kids get out of the house, meet other kids, do things with their bodies, and explore friendships and relationships.

Insofar as schools outside the home will continue to promote learning, we expect them to emphasize new forms of learning. They will emphasize process over content. As access to content (plain information) becomes easier and easier with small computers, the learners of tomorrow will need to memorize less. Mere absorption of content will be less significant. On the other hand, learning how to manipulate that information—learning how to learn, to think, to reason, and to use the tools of information—will be much more significant. In the future, information will be wealth. If the schools of the future can adapt, fine. If they can't, schools in the home may have to take their place.



"Can't I stay up just a little longer and learn my lessons? Please! Please!"

Well, that's the future. What about now? What can you do now with a school in your home? The answer is: many, many more things than we have space in which to tell. In this book we are going to concentrate on one particular type of "school" for your home, based upon the computing power of the ATARI® 400™ or ATARI® 800™* Home Computer. In addition we

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are mostly going to concentrate on one particular kind of “lesson”: computer game playing.

WHAT YOU SHOULD EXPECT

In one word: surprise. You may also experience excitement, enjoyment, amazement, and a bit of chagrin that learning wasn’t as much fun when you went to school.

We are not going to spoil your surprise by telling you everything that awaits you within these pages. We offer you a chance to recapture the thrill of learning through exploration and discovery, and of sharing that sense of wonder with the children in your life. Read on.

2

The ComputerKid Project

**Ramon Zamora* and
Bob Albrecht****

For several generations, “family” has meant the nuclear family: father, mother and children all living together under one roof. However, with the changes brought about by low-cost technologies, why should we not expand our ideas of “family” along with “learning?”

Since learning is a joyful, ongoing process, think about extending your family beyond property lines. In this way, “family” can mean any group of people united together by the learning experience.

Institutions originate to meet specific needs. Schools began to teach children in groups when teaching at home became too much of a burden for individual families to handle. Today, however, increasingly inexpensive information is more easily available in the home, presenting alternative learning opportunities.

Once you have a home computer you can invite another family to share in the fun. Your block, your apartment house, your neighborhood, your collection of friends, can all swap software and fellowship and become the greatest learning center possible.

Be open; be flexible. What we are suggesting is not a rigid, formal structure. Instead, we suggest putting together the best of the past and the best of the future.

* Ramon Zamora, vice president of ChildWare Corporation, creates and designs recreational learning products for use in homes and schools.

** Bob Albrecht is Author, Dragon, and Friend of Children. For over fifteen years he has pioneered giving kids access to computers.



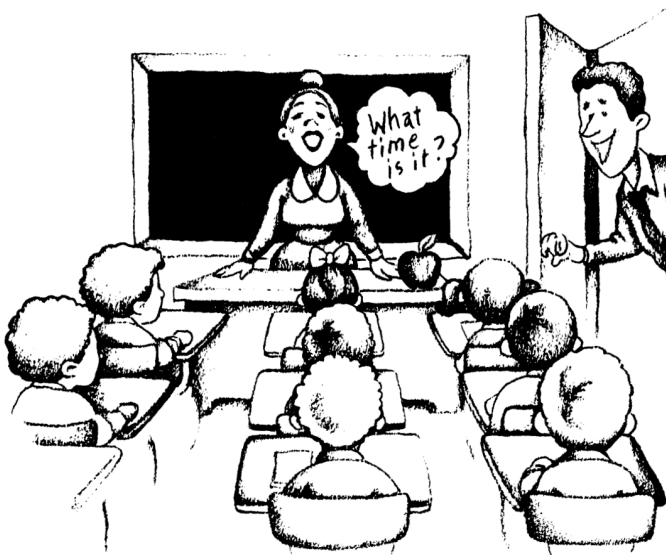
People, working together, make things happen. Let us be open to possibilities and use this new tool in creative, wonderful ways. Remember, the computer is only a catalyst and repository of patiently given instruction, information and amusement.

ComputerKid is just one way in which we have begun bringing “school” into people’s homes. Through the ComputerKid Project, we received most of the software evaluations listed in Part II. As an example of expanding ideas of learning, let us introduce ComputerKid.

Monday: Tim Finger, director of the ComputerKid project, stands in a cluster of young Hispanics, Blacks and Orientals at the Herbert Hoover Boys’ Club in East Menlo Park. Hands wave about in anticipation. They reach for the latest ATARI Computer software packages that Tim carries. As they take products, Tim also gives out evaluation forms. “Let me know how you like the programs,” he shouts over the hubbub. “A couple of you work together so everyone gets a chance to see the new stuff.”

Tuesday: A group of uniformed Girl Scouts listens attentively as Tim Finger tells them about PILOT, a language for the ATARI Computer. Later in the week and after some practice, several of these girls will assist their parents and teachers in learning the language. A flood of exclamations fill the room as the scout at the keyboard creates a multicolor pinwheel on the screen.

Wednesday: The three- to five-year-old kids at Bing Nursery School at Stanford University, Stanford, California, are excited. Today is ComputerKid day. Owen, a four-year-old, watches the door expectantly. He knows that Tim will arrive any minute; he wants to be the first kid to let everyone know when Tim comes through the door. The door swings open, and within minutes everyone is clustered around the computer. Tim hovers over the keyboard, trying to direct the many hands that want to touch and control the action on the screen. Owen, his turn completed, sits off to the side filling out his evaluation form.



"It's computer time!"

Thursday: ComputerKids at the Recreational Center for the Handicapped in San Francisco, have a variety of physical and mental disabilities. Of course that doesn't stop them from using the computer. These kids, like all those at the other ComputerKid sites, have learned to use the computer and have increased their own self images in the process. Kids with missing limbs and kids with mental dysfunctions use the project's supplied software to explore their individual limitations. They often discover that

their abilities exceed their own expectations. A young mentally-disabled child who seems to get distracted by nearly everything, began to focus and concentrate after only a few sessions with *Breakout*. His score on each game moves steadily upward. At first, he was able to score only one or two points. Tim returns the smile, and the kid turns back to the game, ready for a new challenge.

Friday: Tim arrives at ComputerKid's home base: a small room in the back of the Dymax author house offices in Menlo Park. Several local ComputerKids already sit at computers. A chorus of greetings fills the air. These kids are part of the evaluation team that preview new Atari, Inc. software products for the project. "Hey, Tim! Look at this!" Tim peers at the screen. There is a maze of cryptic symbols and graphics on the display. "If you hold down this key and press the rest of the keys, you get all that stuff on the screen," proclaims the kid proudly. He has discovered the ATARI Graphics Characters. "How can I use them in a program? I want to POKE them onto the screen to make monster faces." Tim sighs, another ComputerKid has taught himself more about computers than Tim knows. "Ask Karl" (a 14-year-old computer expert). "He can tell you how," Tim replies, and laughs to himself in amazement at a kid's learning abilities.

Weekends: No rest for the ComputerKid Project. On the weekends, Tim is likely to have people to his home for impromptu computer sessions. Or he may convene a group of kids at the ComputerKid home base for an afternoon of fun on the computers. At times, he even goes directly into a family's home to offer advice and encouragement on the use of the computer. On those occasions, he usually lets the kids in the house take over the demonstration, while he gently encourages parents to accept being taught by their own children.

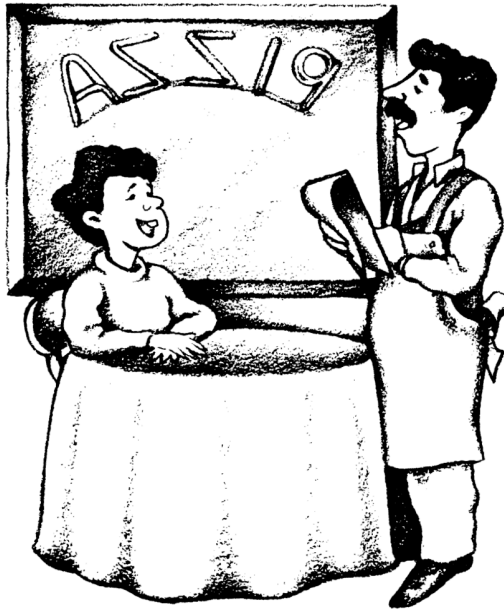
Each week, the ComputerKid project is filled with similar experiences. In and around Menlo Park, California, the youth clubs, scouts organizations, centers for the handicapped, nursery schools, and numerous individual kids have been given the opportunity to use inexpensive home computers, many for the first time. Several ComputerKids have gone on to make presentations about computers to their parents, teachers, PTA groups, and other adults. Many kids now use computers regularly, at home or at one of the community locations that the ComputerKid Project frequents.

How did ComputerKid get started, and what do you need to know about starting your own ComputerKid project?

WHAT IS COMPUTERKID?

ComputerKid began in 1982 as a natural extension of the local computer-literacy project activities of ComputerTown, USA! ComputerTown, USA! was the brainchild of Bob Albrecht and Ramon Zamora, who decided it was time to bring “computer literacy to the entire community.” In 1980, the National Science Foundation began funding this venture; Menlo Park, California, a town of about 27,000 residents, became the home of ComputerTown, USA!

From 1980 through 1982, ComputerTown, USA! took computers beyond the walls of the library, out into the community—thanks to Round Table Pizza Parlor and Kepler’s Bookstore in Menlo Park, which were among the first to host computer nights.



“ I’ll have one large pepperoni and two computer games. Hold the anchovies. ”

In 1981, David Tebbutt (at that time publisher of Britain’s *Personal Computer World*) ventured to the colonies to investigate firsthand this

ComputerTown phenomenon. Delighted with this new approach to computing, Tebbutt journeyed back home to begin ComputerTown, UK! By early 1983, ComputerTown, USA! sites in the United Kingdom numbered 28. Eventually, ComputerTown, USA! grew into an international project with approximately 200 sites nationwide, and 29 others overseas, excluding the UK.

As ComputerTown, USA! was growing into an international project, ComputerKid began to emerge as the local resource for kids' organizations that wanted to work with computers. Under Tim Finger's direction, ComputerKid promoted in-depth experiences with computers for kids of any age and background.

Tim wanted to focus on helping kids become familiar with software, while he observed the learning experiences that took place when kids and computers were brought together. He began by carrying computers and software to many kids. One of his objectives was to train kids to teach other kids, and adults, to use computers.

That is exactly what ComputerKid is all about: kids teaching kids (and adults) how to use the technologies that will influence their world, now and in the future.

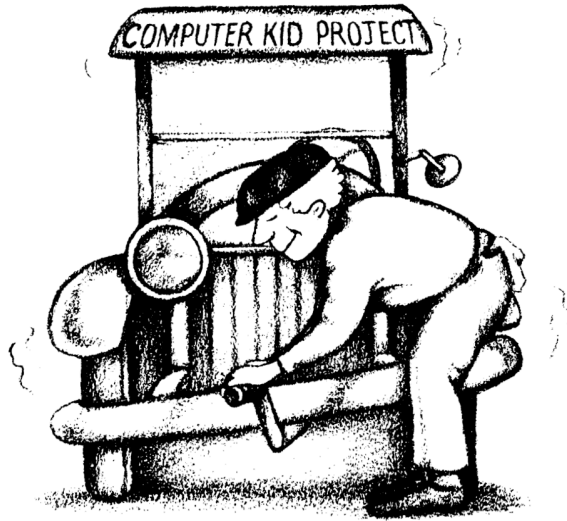
ComputerKid now has a dozen ATARI 400 and 800 Computers in the hands of kids, with more coming. The project maintains a lending library of hundreds of software products. Most of the software has been critiqued by the kids within the project and at the project sites. The software library contains products on tape cassettes, diskettes, and cartridges.

Right now, ComputerKid is a local effort within the Menlo Park community. Tim looks forward to others initiating ComputerKid projects in their own cities and towns, and to the networking of the various sites together.

GETTING STARTED

Anyone who starts ComputerKid activities will end up with a unique ComputerKid project. No two projects will be alike, just as no two kids are alike. Tim offers some suggestions regarding the initiation of your own exciting project.

If you are new to computers, start by getting involved with some friends who have a microcomputer. Find someone who will share knowledge with you, who will patiently answer the many questions you may have, and who might work with you on the project.



When you have had some friendly introduction to computers, read through a few beginner's books, selected articles, and magazines on computers. The Appendix will assist you in locating suitable material. Be aware that these initial steps could take you several weeks or even months. Be patient. Take your time and get comfortable with this new technology.

Next, get some experience with an actual computer, preferably in your own home. Try different software packages. Try some games, some educational products, and some business software. Get a feeling for the computer's capabilities by using pre-packaged software. Don't attempt to learn to program yet!

Now, with all of that experience under your beanie, you have a choice of how to proceed. If you feel you need more information about computers or about programming, consider taking a class. There are numerous computer classes given through high schools, adult education, junior colleges, and in public locations such as libraries and museums. Or, consult our directory for books you can use to teach yourself.

If you think you have enough data and are ready to get going, pick the group of kids you plan to work with, borrow or buy a computer, get a few pieces of software (see Part II of this book), locate a friend or two to assist you, and go for it! Your ComputerKid project will blossom around you before you know it.

TIM'S LIST OF PITFALLS

- 1) **Everything takes time.** Be patient. Don't let the little annoyances sidetrack you or frustrate your intentions. Computers can stop working. Maybe the one you planned to use got dropped or jostled in getting to the site. If possible, keep a spare handy for those moments of frustration.
- 2) **Don't give up quickly.** The tenth person or organization you call may be the one to say "yes." The "no's" from the first nine are difficult to bear. You know your project is valuable and worthwhile. Why can't they see it? The world is full of people who want to assist and contribute to kids. Keep calling and asking until you find them.
- 3) **All TV sets are not created equal.** When a computer is attached to a TV, you often have to fiddle with the fine tuning to get the computer's colors and text to appear properly. In some cases, the TV may even need repair before the computer works well. This situation often arises when someone donates an old TV to your project. Find a local TV repairperson, tell her or him about your project, and let her or him help you decide which gifts are worth fixing up, and which should be passed on to the TV graveyard.
- 4) **Be willing to put in time when other people's time is free.** That is, a healthy ComputerKid project is unlikely to work on a nine-to-five schedule. Kids are only available in the afternoons and early evenings during school months. A lot of youth organizations are only open in the afternoons, or they have scheduled activities and you must conform to their schedules. Also, beware of the temptation to put in more time than you have budgeted for each task or activity. The tendency is to do too much because the project is exciting and rewarding. Find others to work with you who can share the tasks involved. Find a bright and enthusiastic kid who knows more about computers than you do. Ask him or her for help. You'll both benefit.
- 5) **Begin s-l-o-w-l-y and begin small.** Let your initial experiences tell you what to do next. Do not start by trying to organize a huge computer event involving hundreds of kids, dozens of teachers, and dozens of computers. Work with a few kids at first. Later, as you discover what is involved, ex-

periment with larger groups and situations. Remember: There are over 50 million kids in the US alone. That is one kid for every two automobiles. If you were a mechanic, you wouldn't dream of trying to work on all the cars in the nation. So take your time, and don't try to reach all of the kids at once with your project. Wait a few months or years, and when there are enough ComputerKid projects around the country, we can all try together.

When Tim Finger is asked the question of "Why ComputerKid?" he responds:

"Working with kids is the best thing I can do. It is the greatest learning experience I could have. There are so many rewards, that you can't tell people how it feels.

"Kids give you life. They make you feel great, even if they only say 'hello.' Whatever you give a kid, you get back double. They make you feel fantastic."

Well, there you have one example of how computers are being used to help enhance the school curriculum. Some of you may want to start ComputerKid projects of your own. If so, feel free to write ComputerKid, P. O. Box 310, Menlo Park, CA 94025, for more specific details or with any questions you may have. Naturally there is no charge or obligation, but be sure to include a self-addressed envelope!

The majority of you will be content, at least initially, just to put a "school" in your home. But we hope you will eventually extend this school to wherever you can help others share in the excitement and fun of learning.

For all of you, read on to learn what you need to know about selecting and buying a computer system.

3

Buyer's Guide

by Ed Neil

"Be of stout heart and good cheer, Mr. Baggins, for a great adventure is close at hand."

Lord of the Rings
by J. R. R. Tolkien

Before we jump into a discussion of computer hardware and software and other high-tech goodies, let us take a few moments to consider the special demands kids place on computers.

First, the computer should be able to take heavy usage and some abuse. Once a kid gets started using the computer, he or she will really put it through a test.

Secondly, there must be a large number of programs available to meet the different and changing interests of a child. Children will outgrow programs just as readily as they outgrow clothes.

Thirdly, there should be several different ways for the child to give instructions to the computer. Some kids learn better if information is presented visually, while others are auditory learners, and still others use hand-eye skills to master problems.

That's it. Notice we did not say the computer had to be "easy to use." If you think kids can't solve puzzles, we would like to point out the world

record for solving a Rubik's Cube[®] is held by a ten-year-old—a twelve-year-old placed second.

SELECTING THE COMPUTER

With all the good computers on the market today, it can be difficult for novices, or even professionals, to select the “best” computer for a task. Each computer has its own strengths and weaknesses. People try to juggle all the different features to come up with the best choice, to get the most hardware for the buck. Although that is not necessarily the best approach to take, it is easy to get buried by the technical and advertising media blitz.

Relax! Don't let all that stuff intimidate you. You are quite capable of making a good choice. To start with, you bought (we hope) this book. Even if you didn't buy it, you are reading it—clearly the sign of a superior intellect and good judgment. Now, let us put that good judgment to use.

Remember, the computer you select should be:

- durable
- have lots of available programs
- have several different ways of receiving instructions

Price, maintenance, expandability (you can add to it), and ease of use should be considered, but only after the first three requirements are met.

These are the guidelines we would recommend as you shop for a “school” for your home. There are several home computers that might fit these guidelines, and the one you choose might involve other factors such as how much you want to spend, what your local computer store offers, and so on. We used these guidelines and finally chose the ATARI Computer. The ATARI System meets all of the primary, and most of the secondary, requirements for a computer used for education in the home. As you read the rest of this chapter, keep in mind the primary and secondary requirements we've placed on the computer.

If you already have a computer other than ATARI, you can still use the information in this chapter as a general guide in the selection of additional hardware and programs.

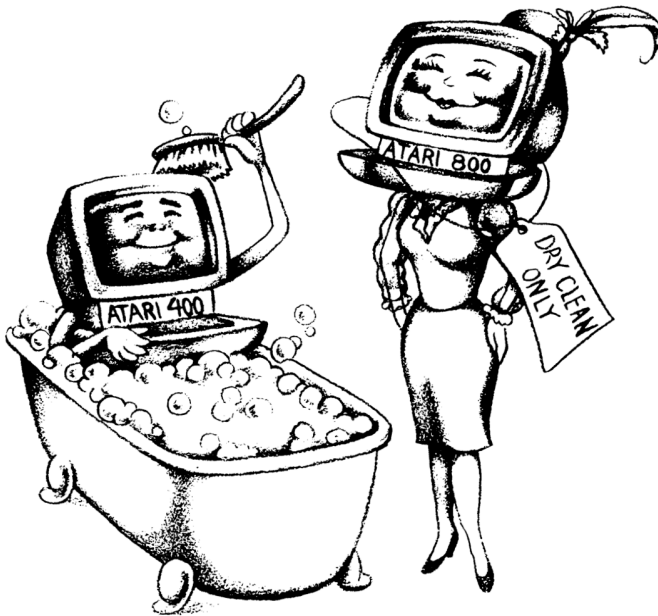
WHICH KEYBOARD?

Two types of keyboards are available for the ATARI Computer. The ATARI 400 has a membrane keyboard made of Mylar,^{®1} the same mate-

¹ Mylar[®] is a trademark of the Dow Chemical Co.

rial you find in microwave ovens. The ability of Mylar to survive water, heat, and dirt make it an ideal keyboard for young children. Mylar keyboards do have one drawback, however; they don't have much tactile feedback. That is just a fancy way of saying you do not feel much when you press a key. No problem. Programs for young children do not require a lot of typing.

The keyboard on the ATARI 800 has the look and feel of an electric typewriter. The keys have good tactile feedback, with concave tops to help fingers center on each key. And like an electric typewriter, the ATARI 800 keyboard allows you to type quickly and accurately, with a minimum of fatigue. This type of keyboard is a little more temperamental than the membrane keyboard of the ATARI 400. The ATARI 800 has a definite aversion to anything wet or sticky so, on this machine, coke and peanut butter and jelly sandwiches are not compatible with *Star Raiders*™. It is simple enough, though, to discourage eating and drinking when working on the computer, and to keep it covered when not in use.



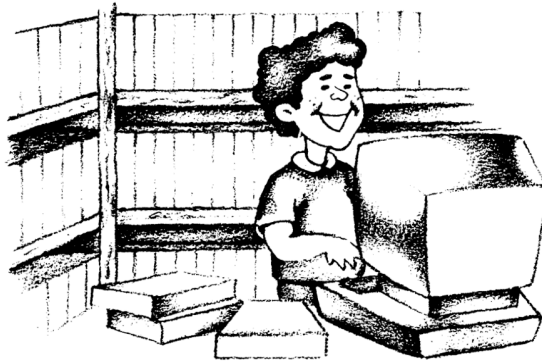
HOW MUCH MEMORY?

Memory is the cheapest item you will buy, so if you're buying a computer, get as much as you can afford.

"Wait a minute!" you say. "Why do I need a lot of memory and what the heck is memory, anyway?" Good questions. A college professor may try to impress you and give you a long, technical answer filled with terms like *magnetic flux*, *cores* and *nonvolatile storage*. All of this is irrelevant. A computer is simply a bunch of electronic post office boxes. Each box has an address and can hold one character of information. A, B, E, J, %, :, are all characters. To store the word SCHOOL takes six boxes, one for each letter. Storing one page of text from *Buy a School for Your Home* would take about 1,000 boxes. Many of the programs we tested for this book use 40,000 boxes. In computer terms this would be called 40K, K representing approximately 1,000.

If you already own an ATARI 800, it is easy to put more memory into your computer. Your owner's manual will show you how. The ATARI 400 is a little more difficult to upgrade, but someone at your local computer store will be happy to help.

A 16K ATARI 400 or 800 is an excellent choice for the beginner, but your choice of programs will be limited by the size of the memory. When you have a large memory (48K), you have few limits. You can run any program on the market today that is of interest to you.



"Whee! Lots of choices."

PUTTING PROGRAMS ON THE COMPUTER

Programs come in one of three ways:

- Cartridges that plug into the top of the computer

- Cassette tapes that are read into the computer through a cassette recorder
- Disks that are read into the computer using a disk drive

To select the best medium for you, let us look at the advantages and limitations of each.

Cartridges are the easiest to use, are relatively unbreakable, and do not require any additional equipment. Young children can use them without supervision. Neat, huh? Unfortunately, cartridges cannot hold very big programs, and data cannot be stored on them.

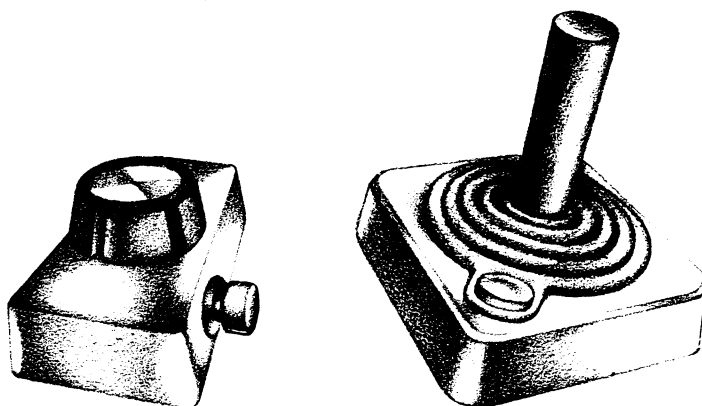
Most of us have seen or used cassette tapes in our cars or stereo systems. These cassettes are identical to the cassettes used with the computer, but instead of music, computer data has been recorded on the tape. A tape can hold a large program, but loading the program (getting the data from the tapes into the computer), can be very slow, and a special tape recorder is required to play the tapes. It is possible to put or save data on a tape, which is a real advantage if you need to stop in the middle of a project and recall the data later.

A disk has large program storage, the ability to save information, and is at least ten times faster than a cassette. Unlike the cassette or cartridge, however, a disk must be handled with care. And, a disk drive is required to read the data into the memory. The following chart gives a comparison of cartridges, cassettes and disks.

	CARTRIDGE	CASSETTE	DISK
Breakable?	No	Maybe	Yes
Additional equipment required?	No	Yes	Yes
Will it hold a big program?	No	Yes	Yes
Loading time	Fast	Slow	Medium
Can I put my pro- gram/data on it?	No	Yes	Yes
Cost?	High	Low	Medium

HARDWARE

Joysticks and Paddles



If you buy a new ATARI 400 or 800 Computer, you also receive a set of joysticks or paddles with the computer. They plug into the front of the computer and enable you to control a program in the computer.

A paddle is a little box about the size of a bar of soap with a rotating knob on it. With a paddle, you can move an object on the TV screen either from left to right or up and down, but not both ways at once. The name “paddle” comes from the early days of video games (remember *Pong*[™]?) when a paddle was used to move a line on the screen in order to hit a bouncing “ball,” in the same way you use a tennis racket to hit a tennis ball. So why don’t they call them rackets? Beats us!

A joystick is like a control stick in an airplane. When you move the joystick to the right, the video object moves right; move it forward and the object moves up the screen. The big advantage of the joystick is that it allows you to move up (or down) and diagonally across the screen at the same time.

By turning a knob or pushing on a “stick,” you tell the program to do something. Depending on the program, you may be telling it to move an object on the screen, answer a question or make a choice from a list of things. Joysticks and paddles are great when you need fast responses in game playing or in problem-solving when time is critical. Paddles are fairly easy to use, but it takes a little time and practice to become skillful with a joystick. Be patient and do not expect instant expertise the first time you use one.

There are several types of joysticks and paddles available to you. The kind you choose will depend on the types of programs you run, and the zest

with which your children handle the equipment. Standard paddles and joysticks (the kinds that come with the computer) are fine for light to moderate use, but they do not stand up well under heavy usage or “enthusiastic” kids. Don’t blame the kids if the joystick breaks after a few months; most joysticks were not designed for durability.



“Oops!”

For the heavy or “enthusiastic” user, we recommend the arcade-quality equipment. As the name suggests, these joysticks and paddles are designed and built for the brutal world of the video arcade; they can really take it! Some manufacturers will give up to a two-year warranty on their equipment, and that says a lot about their confidence in their product. Check the Appendix for a manufacturers’ list.

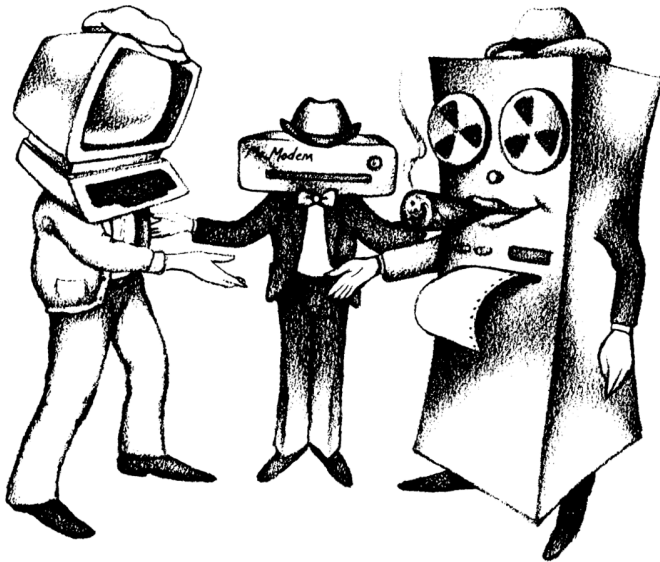
The true connoisseur of video game joysticks will use different types of joysticks depending on the game being played. For a maze game (such as *Pac-Man*), most connoisseurs prefer a looser joystick with a lot of movement to minimize wrist fatigue, whereas a taut stick is better for programs requiring quick, precise movements (such as *Missile Command*[™]). When you visit your local computer store, try both types. You might want to have one of each.

Modems

Most of us do not think of a home computer as a communications device, but it is! With the addition of a special piece of equipment called a modem, your computer can “talk” to other computers.

In order to “talk” to another computer, you need to take information from your computer and put it into the other computer, and vice-versa. You achieve this by using a telephone line to carry the information back and forth. Since telephones are designed to carry voices and not computer data, you use a modem to change your computer data into a “voice.” Once your computer data is changed into a “voice,” you can send it over the telephone to the other computer. The other computer listens to the telephone through its own modem and the “voice” is changed back into computer data.

It is quite easy to do. The modem plugs into both the telephone line and your computer. You dial the phone number of the other computer owner and—presto! The computers are communicating.



“I’ve always wanted you two to meet.”

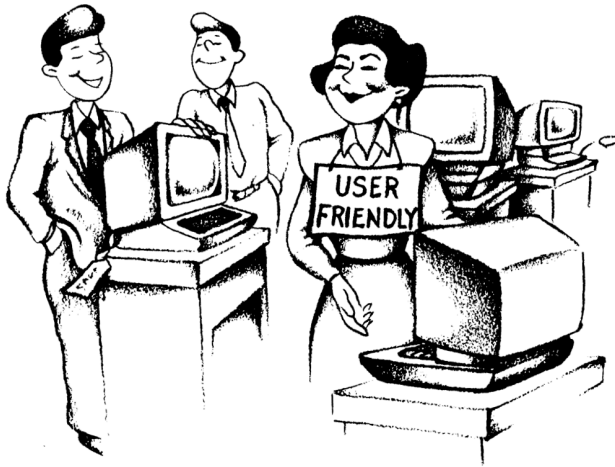
A modem is not needed to run any of the games and programs we discuss in this book. However, in putting a “school” in your home, you can use a modem to obtain information on any number of subjects without depending on software at all. “What sort of information?” you ask. Well, for starters, how about current airline schedules, up-to-date stock market quotes, sports reports, and weather conditions and forecasts for any part of the country? Why should kids have all the fun? For a complete list of computer services, check the Appendix.

WHERE TO BUY

Computer Stores

Of all the places you can buy a computer, retail computer stores can provide more information about hardware and software than anywhere else. The sales staff is usually knowledgeable and helpful—a major asset to the buyer. Sometimes the staff is so knowledgeable, the beginner may not be able to understand the *computerese* they speak. So if you are a beginner, be sure to ask for a salesperson who is “user-friendly.” This should set you off to a good start in getting the information you want.

Although computer stores offer support and service, you pay for this specialized knowledge with higher prices. The services are a value if you have questions or problems. Computer stores usually carry a large assortment of software you can try, or compare to other programs you have heard about, before you buy.



Mail Order

Because of low overhead and large volume, mail-order houses can offer attractive prices on equipment. If you are a bargain hunter and can

wait up to a month for your order, you can save up to 25 percent or more, which can be a significant savings.

Here are some tips for trouble-free mail order buying.

- Make sure you know exactly what you are ordering. There is nothing worse than opening your package only to say, "But I thought I ordered an . . ."
- Try to find mail-order houses that have toll-free 800 numbers. When you call you should ask
 - 1) Current price, including shipping costs and taxes, if any.
 - 2) When you can expect delivery.
 - 3) What warranties come with the equipment and who is offering a warranty. Make sure the product is backed up by Atari, Inc. If Whizbang Company offers its own warranty, then only Whizbang Company can repair the product.
 - 4) What the terms of payment are. Some companies will ship C.O.D. for a small additional charge. If you are happy with the answers you receive, you may want to place your order over the phone. This can reduce the number of days spent waiting for your order to get to you.
- Use common sense in finding a price. If a deal sounds too good to be true, then it probably is.
- Keep a complete record of your order. If a problem arises in your transaction, photocopies of your order and check or money order are valuable pieces of documentation.

If you have a problem, get in touch with the company immediately and give them a chance to remedy the situation. If you do not get satisfaction, contact the Direct Mail Marketing Association, the Better Business Bureau, the Postal Inspector-At-Large, or the Federal Trade Commission. A good tactic is to drop a letter to the company informing them of the agencies you have contacted.

Discount Houses

If you know *exactly* what you want, a discount house may be the ideal place for you to buy your equipment. Since these places buy equipment in

huge quantities, they can sometimes offer prices that even the mail order people can't match. But do not expect the sales staff to be of much help, or the store to carry a large selection of equipment or software. Watch the newspaper for sales and be patient. It can really pay off.

BUYING USED EQUIPMENT

Computers

The guidelines for buying a used computer are a little different than buying a used car. As do many women and men, a computer gets better with age. Why? On the average, electronic parts that have been used are more reliable than when new. If the computer has worked well for six months or more, chances are good that it will continue to do so.

The weak areas of a used ATARI 400 or 800 Computer are the mechanical parts. Check the keyboard to make sure all keys function properly. Look at the cartridge slot to check for excessive wear or abuse. Examine the connectors at the joystick ports, power plug, and serial bus. Be sure all of these connectors are not loose or worn, and all the pins are in place. Defective connectors are hard to fix, expensive to replace and can drive you crazy. If you have any doubts, pass the deal by. You will be ahead in the end.

Disk Drives

Buying a used disk drive is at best a dicey business; it is almost impossible to thoroughly evaluate one without special equipment. Although you may decide it is worth the risk, you cannot buy a used disk drive with the same level of confidence with which you can buy a used computer. Check the want ad section of your newspaper where you will probably find a computer equipment column. For maximum protection, ask for a trial period of at least one week to check the equipment for proper operation.

COMPUTER CLUBS

User groups or clubs are not sponsored by computer companies. Instead, they are small local groups of interested users—in our case, users of ATARI Computers. They are a little like a garden club where people get together to swap hints for preventing root rot, and brag a little about their begonias. These groups can be a gold mine (silicon mine?) of information about hardware and software.

Many groups have made special arrangements with manufacturers and distributors to give lectures and product reviews to the club. In fact, some clubs are used as test sites for new software releases. Most clubs usually have a member or two who are able to tie into the computer industry grapevine with gossip on the latest products and problems. It is not always relevant, but it is fun to hear the inside stuff. Most clubs also have software libraries that are shared among the membership.

Clubs usually meet once a month in the evening in a school or other public building. Dues vary from club to club but are minimal, considering what you receive in information, shared software and support from other members. User groups are a great place to find out who has the best deals on hardware, software, and just about everything else you want for your own computer. A list of user groups can be found in the Appendix.

WHAT YOU NEED TO BUY

Throughout this chapter, we have discussed different components of a computer system and how they relate to the family's demands. Let us sum up with a couple of hypothetical families who want to put a "school" in their homes.

Mr. and Mrs. User have two children, Scott, age six and Diana, age four. The Users want to help Diana get a head start before beginning school and want to help Scott with math. Mr. and Mrs. User enjoy card and board games but have little interest in video games.

Considering the ages of the children, the ATARI 400 with 32K memory (and its Mylar keyboard) is a good choice. Heavy-duty joysticks are a must, as is software on a cartridge so the children can play with minimal supervision. Cassette software can be used with only a little instruction in Scott's case, and with some supervision in Diana's.

The next family, the Players, have a son, Tait, age nine, who enjoys video games. He has been badgering his parents for a home video game player (VCS). Mr. and Mrs. Player would like to learn about computers and would like to use a home computer to help them learn the rudiments of programming.

Tait, at age 9, can easily handle an ATARI 800 Keyboard, an arcade-quality joystick, and possibly a disk-based software. So our computer "school" system can be an ATARI 800 Computer with 48K and a disk drive. The 48K memory and the disk drive allow the maximum flexibility for both Tait's needs and his parents desire to learn programming. After all, "school" is for everyone!

When you go to buy, use this chapter as a general reference, add some common sense, and have a bunch of fun.

4

Learning Basics with the Computer: Preschool

by
Charlene Scholtes Margot*
and
Nancy McIlvoy Armstrong**

When most people think of “computers” they conjure up pictures of teens playing video games, or businessmen and women hunched over their electronic spreadsheets. But microcomputers have entered the lives of children three-, four- and five-years old. Today’s preschoolers are likely to play “house” with new roles: “Pac-Mommy,” “Pac-Daddy” and “Pac-Baby.” Instead of equipping their pretend “office” with desks and typewriters, they may instead build “computers” out of wooden blocks. The computer has a place now in the educational options for very young children. Familiarity with computer hardware, software, and the jargon of computers may give children a head start in the many computer-based activities they are likely to encounter in their lives.

The use of computers can be a tremendously motivating experience for children. Children seem naturally drawn to computers. If their experience with the computer is an interactive one, they will be motivated to focus, increase their attention span, and develop important cognitive skills. Colorful, interactive software available for children as young as three-years old, can help preschoolers gain prereading, premath, logic and problem-

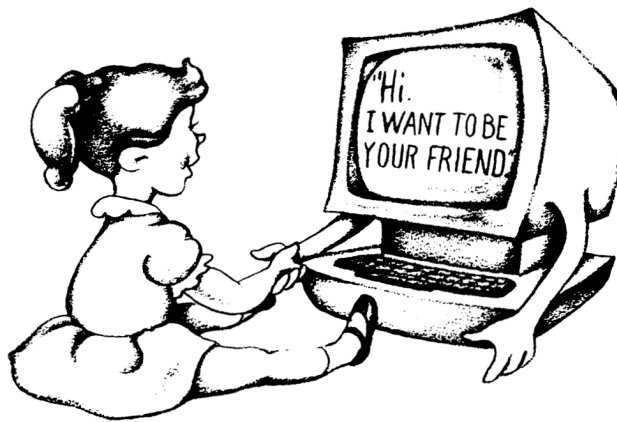
* Charlene Scholtes Margot is a teacher at Bing Nursery School, Stanford University, Stanford, California. She received her Bachelor of Arts degree in psychology at Stanford where she was a Phi Beta Kappa.

** Nancy McIlvoy Armstrong also teaches at Bing School. In addition, she is a computer education consultant.

solving skills. Music, color, and engaging graphics all combine to increase the child's ability to focus on and attend to new learning material.

Motivation and self-esteem are critical in determining whether your child will be ready for kindergarten. A youngster who feels good about himself or herself is more willing to take risks and approach new physical, social, and intellectual challenges. It is like a child who has a whole pile of poker chips versus a child who has just one. The child with many is more willing to take risks or play the chips. The child with just one chip guards it carefully; he or she is afraid to play or take a chance for fear of losing everything. The computer can be an aid in helping children have a positive, successful educational experience.

Children can enter into a "friendly" relationship with the computer, and their learning is reinforced with immediate feedback. Computers give children undivided attention, and have infinite patience—two things difficult, if not impossible for parents and teachers to achieve.



Children feel good about taking charge of their own learning, and with the computer they can take on the role of teacher. Children can give the machine commands, and then make choices about the game or activity they want to play. Children who feel in control of the computer gain a tremendous sense of self-satisfaction and personal success. When a three- or four-year-old child is able to turn on the computer and TV monitor, and load the disk drive, the child feels real power—something he or she often lacks in a world of grownups!

Certainly, it is important for preschool children to assert their independence. The computer should always be a *choice* for your child, balanced

by the many other activities he or she needs for healthy physical and mental growth. As an option, computer learning can offer even very young children exciting new ways to gain concepts and build cognitive skills.

PRESCHOOL SKILLS

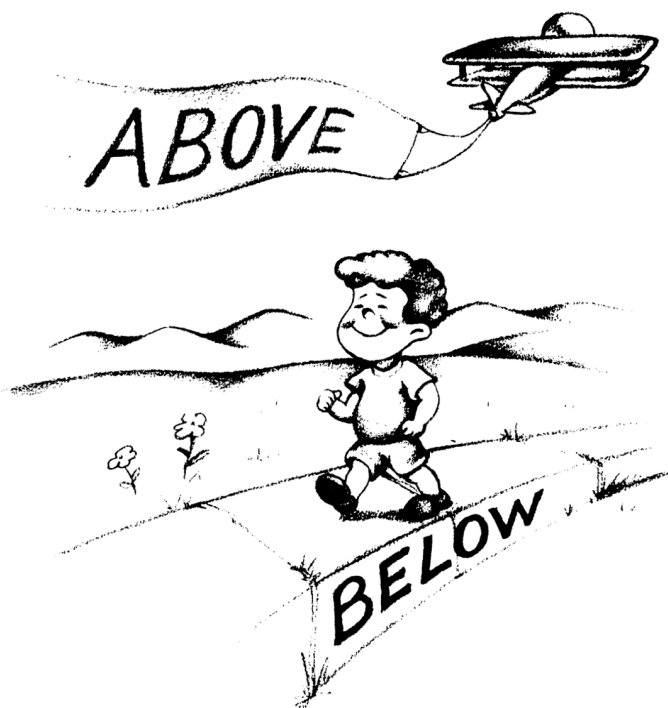
There are important cognitive or “mental” skills your child needs in order to be ready for kindergarten. Before a child can learn to read or do simple mathematics, he or she must have developed a firm foundation of prereading, premath, and problem-solving or logic skills. Just as your baby had to crawl before taking those first steps, so too must he or she learn to “play” with the shapes that make up letters and numbers before recognizing the alphabet or numerals.

The computer can help your child with prereading and premath skills by encouraging experimentation with shapes, colors, letters and numbers. A child who has had experience with symbols will later more easily understand that when you put C, A, and T together, it spells CAT. By allowing your child to explore the letters and numbers of the computer keyboard, you are giving him or her practice in discriminating, or picking out, all the symbols that he or she will be manipulating for the next few busy years in learning to read or do simple math. A child as young as three-years old can pick out specific letters on the keyboard, and will be adamant about locating them without help. As one little boy said, “Don’t tell me! I know it’s here somewhere!”

Prereading Skills

One of the first things your child must have to be ready for reading is a good grasp of spatial concepts: “above” and “below,” “left” and “right.” Children need to always orient themselves to the left-hand side of the paper or chalkboard to begin reading and writing. They must also be able to distinguish “upper” from “lower” or “above” from “below.” When the kindergarten or first grade teacher tells children, “Start at the upper, left corner of your paper. Put your pencil above the line,” young students can be easily confused by all these abstract directions. The activity of drawing shapes or printing letters and numbers may seem simple, but the “direction” words the teacher uses are not.

The computer can help children gain these abstract concepts and learn to follow directions, with interactive games designed to be visually interesting and cognitively stimulating. A program such as The Learning Company’s *Juggles’ Rainbow™*, teaches children relational concepts of “left/

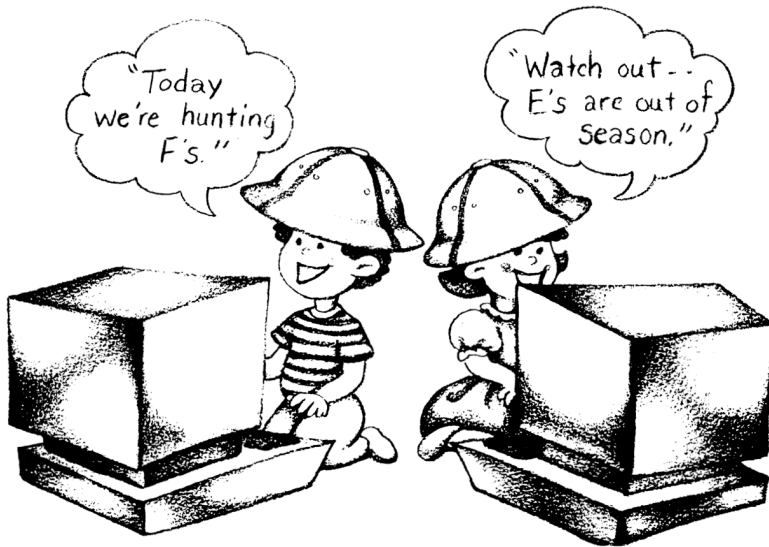


They must be able to distinguish
"above" from "below".

right" and "above/below" using playful, colorful graphics and cheerful melodies. In *"Juggles' Rainbow"*, children press keys "above" a blue strip of paper to form cycling rainbow colors, and "below" to watch dancing rain appear. In *Juggles' Butterfly™*, a butterfly with changing colors on its wing illustrates concepts of "left" and "right." In a related program called *Juggles' House™*, children work with the spatial concepts of "inside" and "outside" as the computer forms a house and garden filled with delightful characters.

The more familiar children can become with the lines and curves that make up the shapes of letters in the alphabet, the easier it will be for them when it is time for reading. Every parent knows how children delight in finding the letters of their names in newspaper print, or reading the big letters on the red STOP sign. These kinds of first-hand experiences with letters or symbols are excellent for prereading youngsters. When he or she can easily and continually identify shapes, colors, and letters, the child is ready to move naturally into learning to read.

Simply allowing your child to explore the keyboard of the computer is an excellent way to give him or her experience with distinguishing letters that look alike. For adults, of course, letter identification is second nature, but when you are four-years old, an "E" looks very much like an "F," and it is hard to tell a "b" from a "d." An excellent program that allows children to play with individual letters is the game *Scribble* (part of Spinnaker Software's *KinderComp*™ series). In this game, children press a single letter, or any other symbol, and get an entire colorful row of that letter printed across the screen.



Being able to distinguish shapes and letters that look alike is called "visual discrimination"; it is an important prereading skill. Computer games that have children match patterns or tell "what's different" are good for developing observational skills. In *KinderComp*'s match game, a pattern appears on the screen, and children must then pick a match from among three similar patterns.

In one of the *Juggles*' games, children must combine spatial concepts with visual discrimination. The computer introduces children to the four hardest letters of the alphabet: lower case "b," "d," "p," and "q." (Children find these letters difficult to distinguish since their "tails" point in four different directions.) This program lets preschoolers explore lines and circles that make up these letters by arranging the "tails" in four quadrants ("above/right" for the letter "d," etc.).

Learning to read involves both a good "sight vocabulary" (knowing letters and simple words by sight alone) and the ability to put sounds to-

gether to form words. Once children become familiar with the letters that make up the alphabet, they can begin to learn the sounds or “phonics” that go along with the letters.

Computer programs actually emphasize phonics in the way certain keys are used to give program directions: “F” for “fill,” “S” for “stop,” “Q” for “quit,” etc. Even if children do not initially make the connection between letters and sounds, by using these commands over and over, they will remember the letter and begin to use it with the words they represent. Several computer games on the market encourage this kind of phonic recognition. For example, Atari, Inc.’s *My First Alphabet*™ responds to a typed letter with a picture and a full word based on the letter: type “A” and an airplane will appear on the screen. The child must then relocate and press the same key on the keyboard to receive a musical reward.

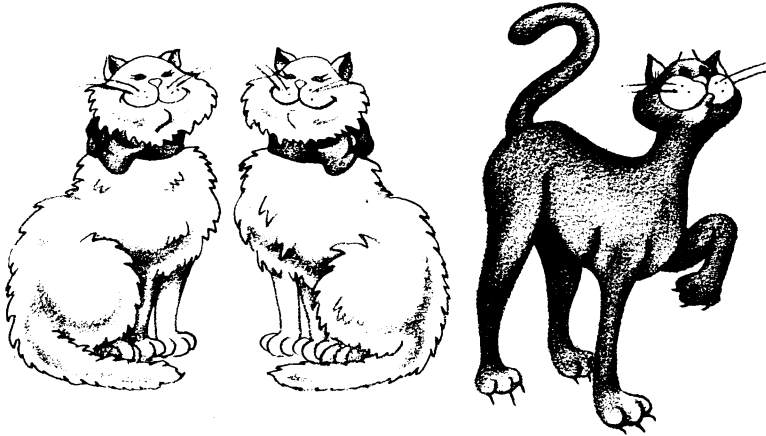
The position of the computer keyboard and monitor screen also gives children experience with relating a horizontal plane (the keyboard) to a vertical plane (the screen). In school, children will need to be able to do this as they relate their flat desk surfaces (horizontal) to a chalkboard (a vertical plane). Very young preschoolers have difficulty relating what they do on the keyboard (“I push an A”) to what appears on the computer screen. With experience, however, children delight in the discovery of what they can do—“I made an A!”—once they have made the connection between a keypress and an effect on the screen.

Children can also increase their fine motor skills by learning to press accurately the keys of the computer keyboard. Using a joystick or paddles will also give your child the practice he or she needs to later handle a pen or pencil with good manual control. You may even find that your child will naturally orient his left hand to the left side of the keyboard, and right hand to right side. Fine motor skills and good left/right orientation are important concepts for prereading youngsters. Computer programs should always move graphic displays from left to right.

Premath Skills

Many of the skills that children need to acquire for prereading are also important in developing premath concepts. Children must have a clear understanding of spatial or relational opposites: “above” and “below,” “left” and “right.” To begin counting, ordering, and measuring using numbers or symbols, your child must understand numerical “position.” He or she needs to look habitually to the *left* side of a series or sequence. Similarly, he or she must be able to recognize the “first” object as the one on the left, and the “last” object as the one on the right.

Children must also be able to observe symbols in increasing detail, and look for similarities and differences. In order to recognize the difference between the shape of a “2,” a “3,” and a “5,” children must be familiar with the lines and curves that make up these shapes. Programs such as *Kinder-Comp*, that give children practice in recognizing “same” and “different” patterns, are good for developing visual discrimination.



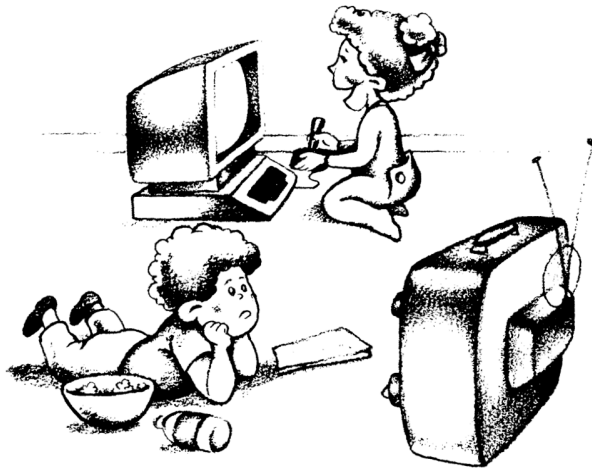
Give children practice recognizing “same” and “different”.

Once children begin writing numbers on their own, they often reverse the direction of the numerals. For example, a “7” will come out “.” This is very common, and shows that children attend to the shape of a letter or number before they notice the direction it faces. Lots of visual experience with number symbols will help children recognize correct shape and direction. In a program such as *My First Alphabet*, where the numbers appear in bold graphics on the screen, it may help to trace the number with your child’s finger and encourage her to do this on her own.

Preschoolers need to be able to understand “quantity” and relate amount to a specific numeral; a child who can count to ten may not yet understand that “6” stands for six distinct objects. *My First Alphabet* encourages children to count the number of smiling clowns, and helps kids make the connection between amount and number. In this game, children must pick the number of clowns with a smile from among an array of nine clowns—some smiling, some frowning. Children use observation and discrimination skills as well! When kids correctly count the number of smiling clowns on the screen, they are developing one-to-one correspondence; they are learning to match *every* object with a number.

Logic and Problem-solving

The home computer is especially suited to providing children with new and exciting challenges in logical thinking and creative problem-solving. Many programs designed to teach children premath skills also lead to the development of ordered, logical thinking. Computer software can help children gain spatial concepts, and encourage ordering or sequencing skills. Children must also be able to recognize patterns ("same" or "different") and analyze them closely to discriminate specific attributes ("tall" or "thin"). Such concepts are important for children, as they develop logic and problem-solving skills.



Their interaction with the computer is an active rather than passive one.

Other programs introduce children to procedural thinking, and the "step-by-step" approach necessary for elementary programming. *Delta Drawing™* (a Spinnaker Software product) allows children to plan or "program" their own colorful graphic designs using simple, single-key commands. Children can experiment with cause and effect, observing how their input through keyboard or joystick results in exciting, graphic displays. Their interaction with the computer is an active rather than a passive one, and children enjoy seeing their ideas instantly translated into "computer art."

Computer programs in which children are encouraged to make inferences and test hypotheses also build problem-solving skills. When young children must try new approaches to problems or take mental risks, they are

expanding their abilities to reason and think logically. Children can use a program such as *Juggles' Rainbow* on many intellectual levels. While children learn simple spatial concepts, they also test hypotheses about how to manipulate the positions of colors in cycling "rain" and "rainbow" patterns. Color bands move one space with each keypress, so children experiment with being able to "match" color patterns above and below a blue line. As children try to predict pattern changes, they are actually using inductive reasoning—an important skill for problem-solving.

First-hand experience with computer hardware and software reinforces logical and sequential thinking for young children. Children must learn how to turn on the disk drive, computer, and TV or monitor in a specific order. They need to *listen* to adult instructions and then *follow directions*. In addition, the use of correct terminology—"The program is loading so we must wait for the red 'Busy' light to go off"—also encourages logical thinking.

BING NURSERY SCHOOL FIELDTEST

In 1981, Dr. Ann McCormick Piestrup began fieldtesting some educational software she had designed at Stanford University's Bing Nursery School. Dr. Piestrup originally became interested in preschool educational software when her own daughter was two-years old. Since that time, Dr. Piestrup's work in designing colorful, interactive software that is "playful, success-oriented, and that presents information in manageable bits," has led to the founding of what is now The Learning Company (TLC) in Menlo Park, California.

Bing School provides a laboratory facility for the Psychology Department of Stanford University, and is known throughout the world as a setting for research on child development. Bing's enrollment is open to all; children come from Stanford's faculty and student families, as well as from the surrounding community. The school environment, both indoors and outdoors, is carefully planned by teachers to reflect the cognitive, physical, and emotional needs of young children. The curriculum offers a balance of free-choice play and directed group play with activities in creative arts, dramatic play, science and nature, language arts, blocks, manipulative toys, and music.

During Piestrup's fieldtesting, the computer was set up in a Bing classroom as an interest center. It was available to children during indoor free-choice play, and turns were given on a first-come, first-served basis. The

computer choice was balanced with painting, block building, and other regular nursery school activities. Fifty three- and four-year-old children took part in the first test, including Ann Piestrup's daughter, Sarah. The initial test program used color graphics, music, and digitized voice to present reading-readiness concepts: above/below and left/right.

The purpose of Dr. Piestrup's fieldtest was to determine

- 1) whether using a computer in a preschool classroom was feasible;
- 2) whether the program would be interesting to children;
- 3) whether children would be able to move through a lesson sequence easily;
- 4) whether children could learn concepts of above/below, left/right; and
- 5) how boys versus girls would approach the computer.

Dr. Piestrup found that using a computer in a preschool setting was indeed feasible. She found that children were eager and excited to have turns. So many children wanted to play, in fact, that turns had to be limited to five minutes and waiting lists were set up. "Can we use the computer today?" children asked, or as one little boy put it, "I want to go and press those keys!" Teachers were pleased that children continued to seek out social contacts and wanted to share their discoveries with other people. Children brought friends for shared turns; they talked with teachers and other children about what they were doing; they drew pictures and sang songs related to the learning material. Children alternated keypresses for joint creations, and played color matching guessing games. Seldom was a child alone at the computer. Usually there was at least one "watcher" to share ideas, observe quietly, or offer encouragement. Four-year-old children would give help to the three-year olds: "You're going to make a butterfly! You got it to match!"

Preschoolers in the Bing pilot study were tested to see if they were learning the spatial concepts. Dr. Piestrup found that about twice as many children passed "right/left," "above/below" concept tests after using the programs, than they had before using them.

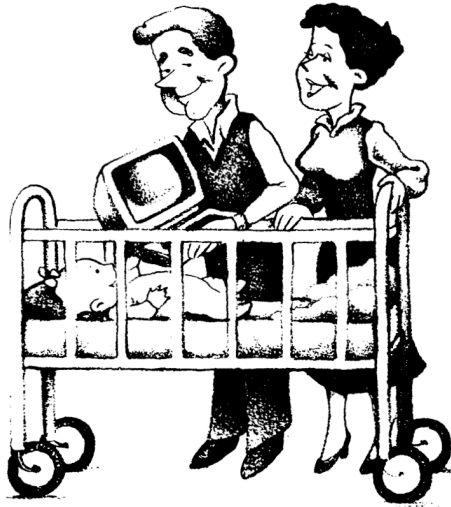
At the preschool level, Dr. Piestrup's testing showed boys and girls to be equally interested in using the computer. At Bing there was no sense that the computer was a "boy" thing, although children of this age *do* have clear-cut ideas about "boy" and "girl" activities.

The pilot study suggested that even children as young as three-years old can use computers easily and improve skills.

With the computer as a regular part of the Bing classroom, children accepted it naturally as another learning choice. "Since computers are likely to be such an important part of their world, preschool does not seem to be too soon to introduce children to playful, interactive computer experiences," says Dr. Piestrup.

Bing continues to be a fieldtest site for The Learning Company. The children at Bing have had the opportunity to use the Apple^{®1} II, the ATARI 400 and 800, and the IBM Personal Computer.^{®2} Computer learning has been comfortably integrated into the general nursery school curriculum.

It is important for parents to remember that, while the computer can be used for very young children, the children at Bing were working with adult assistance. The younger the child, the more supervision is needed. Many children can learn from and enjoy programs geared to an older age range, provided they have the loving help and reassurance of a parent close at hand. We especially want to encourage parents of very young children to play with their kids as they learn at home on the computer.



"I know the book said we should start early,
but don't you think she's a little young?"

¹ Apple II is a registered trademark of Apple Computer, Inc.

² IBM Personal Computer is a registered trademark of IBM Corp.

PARENT GUIDELINES FOR EVALUATING SOFTWARE

Selecting educational software for a child is an important, but difficult task for many parents. There are certain considerations you need to keep in mind in order to provide your preschool child with a positive and enriching computer experience.

First of all, consider your *own* child's needs, capabilities and interests. Be sure the program material is at a level where your child can be successful. While there are many good software programs on the market, few software publishers have yet learned how to gauge the optimal age range of their products' users. Some programs that are supposed to be appropriate for preschoolers can be frustrating and confusing for three- and four-year olds, while other programs are too easy for the age range for which they claim they are designed. Talk to teachers, read reviews, test the programs before you buy. Try to determine if the program is both challenging and fun for *your* child, no matter what the package may say. (And remember, the more guidance you give, the higher the level with which your child is apt to be comfortable.)

A sense of competence and self-esteem are critical for children's success in school at all levels. Programs should be of moderate difficulty with built-in, progressive intellectual challenges. Material must be presented in a clear and logical manner. After a few trials, children should be able to operate programs independently. For best results, computer program commands should be limited to easy, single-keypress directions: "C" for clear, "D" for draw.

Gerald H. Block, Ph.D., editor-in-chief of *Computers, Reading and Language Arts Journal (CRLA)*, has composed a list of specific guidelines for evaluating educational software. He recommends the supporting literature that accompanies software should define the "educational goals" of the program. Programs should then offer learning challenges that achieve these goals.

Good software should motivate and hold the attention of your child even after repeated use, while still providing a rewarding learning experience. Look for software with "staying power." Play is the basic ingredient of children's learning, and computer education should be designed with this in mind. When children use quality educational software, they become so involved that learning is more like play than work. For example, in The Learning Company's *Juggles' Rainbow*, children delight in being able to

form a multi-colored rainbow and dancing rain, while at the same time gaining prereading concepts of “above” and “below.” Children enjoy games that promote learning and creative thinking through the playful nature of the software. Computer graphics, music, and color should clarify program concepts and enhance learning. A home computer system used with children should include a color TV or monitor whenever possible to utilize color graphics.

When children have control over their own learning and can feel a sense of task mastery, their self-esteem is enhanced. Educational software should be success-oriented, that is, programs should not allow for failure. Even three-year-old youngsters can operate computer hardware—they can load a disk drive and turn on the computer and TV monitor. After some adult instruction and guidance, preschoolers can operate programs on their own and achieve positive results. This contributes to a child’s high self-esteem, we believe the most important quality necessary for a successful school experience.

Programs designed for preschoolers should have instructions a child can learn quickly, and should be easy to begin and end. Inappropriate responses should get helpful feedback, not offensive responses, recommends CRLA Editor Gerald H. Block. Spinnaker Software’s *KinderComp* program uses a smiling face for correct responses, with a gentle frown and teardrop for incorrect responses.

Software for very young children needs to be interactive, meaning that children must do something with the machine. Preschoolers like to make things happen and feel that they can affect their environments. Programming designed to involve children in their own learning can challenge their thinking in new ways and lead to fresh intellectual discoveries. With interactive software, children take control; they don’t just watch a show on the computer. Children are inquisitive and want to see immediate, visible consequences for everything they try. This interaction makes a child’s computer experience very different from watching television. Children learn by doing! When the computer becomes a playful “partner,” a child’s educational experience is enriched.

The kinds of experience we offer young children are important for their growth and development. Parents should decide what they want their own children to gain from using computers in the home. As a parent and educational researcher, Dr. Piestrup, founder and chairman of The Learning Company, had the needs of her own preschool daughter in mind when she designed her first learning games:



Pre-schoolers like to make things happen and feel they can affect their environments.

"I wanted my child to use the computer playfully, not to wait for it to do time-consuming tricks between keypresses. I wanted her to have time to think about what was happening, not to be defeated by little flying balls on the screen. I wanted her to have surprises, to discover things experimentally. I wanted her computer experience to resemble sandbox play, not a game arcade or old teaching machine. I wanted the computer to generate consequences to her actions, but not beep and flash, "WRONG! YOU LOSE!" I wanted the computer's messages to be as considerate as those of her nursery school teachers."

Computers give children their full attention and respond quickly. Programs that are self-pacing let children make decisions about the rate of their own learning. As one little boy sitting quietly before the computer said, "Wait . . . I'm thinking!" Preschoolers need plenty of time to collect and organize their thoughts. No parent needs to be reminded how impossible it is to rush a stubborn four-year old determined to dress himself! The computer is infinitely patient, which makes it a valuable tool for very young

children. Choose software that allows your child to move at his or her own speed, play a game many times over, or move on to a new task independently. When purchasing software, try to find a retailer who allows you and your child to preview a demonstration disk.

The computer should always be a choice, one of many activities that balances your child's growth. It is not a replacement for parent contact or involvement! Your child may be able to play independently at the computer after you supervise her or him in getting started. You may also enjoy playing along with your child, taking turns and sharing in the excitement of the computer. Gordon Davidson, an attorney in the San Francisco Bay Area, sometimes uses the computer with his four-year-old daughter, Laurie, as a "special time" for 15 to 20 minutes before bed. They enjoy one another's company, and computer learning becomes a very personal, playful activity.

5

Learning Basics with the Computer: Grades 1–3

by
Sally D. Harris*
and
Marie Kitajima**

Computers have arrived in the public schools and in the homes of school children. Parents who bring computers into their homes are discovering the many educational values of the computer for their primary grade school children. Parents and teachers find the computer provides an educational option that can enhance the total educational program without ever replacing parent or teacher.

Computers now serve as tutors for the mentally handicapped, as a means of expression for the physically handicapped, as reinforcement for skills learned by children in the primary grades, and as a challenge to develop thinking and simple programming skills for all students.

The computer promotes active learning. The computer encourages responses that require children to engage and develop various thinking skills. Some of these thinking skills can be expressed creatively on the computer through language play, colorful graphics and simple programming.

Computers can motivate. Children have lots of fun with the computer and love the colorful graphics. Positive reinforcement for success is built into most software. Wrong responses are often limited. And when children make mistakes, they are usually told by a nonjudgmental computer to “try

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** Marie Kitajima is a teacher for the Primary Grades Computer Program in the Menlo Park City School District. She also heads the Math Learning Center at Laurel School, also in California.

again.” The computer has infinite patience and waits for children to formulate their thoughts before demanding a response. The child has the computer’s full attention, and any fears of computers “taking over” are eliminated as the child learns the joys of telling the machine what to do.



The child who is familiar and successful with a computer will generally like the machine. Such a child will then be prepared as an adult to deal with computers in an effective and creative manner.

THINKING SKILLS

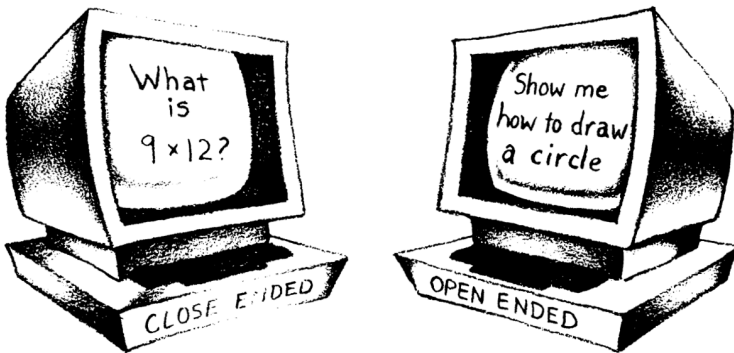
The computer can help your child to be an investigative creator of ideas. Researchers such as Benjamin Bloom, in discussing thinking skills, generally divide cognitive operations into two basic groups: low-level and high-level. Low-level thinking refers to knowledge, comprehension, and application. High-level thinking is described as analysis, synthesis, and evaluation. All school-aged children in regular classrooms are quite capable of operating at either of these cognitive levels.

Many studies confirm the notion that higher-level questions yield higher-level responses and understanding, while lower-level questions elicit lower-level reactions. Computer software provides a type of questioning strategy for your child. Questions asked by the computer can also be divided into low- and high-levels. Low-level questions are those that have singularly correct answers considered to be narrow, close-ended, and

convergent. High-level questions have a multitude of answers and are considered to be broad, open-ended, and divergent. Many people believe that divergent questions help realize the goals advocated under the label "discovery learning." These goals include building the self-esteem of the discoverer and offering the student a sense of autonomy and intellectual potency. Advocates of "discovery learning" place a value on questioning strategies that require more from the student than just memory and convergent thinking. By developing various cognitive functions, students are able to reach their intellectual potential.

Researcher Frank L. Ryan found that students receiving a higher-level questioning-type of instruction were superior to a control group in their ability to respond to both high- and low-level questions. He surmised that "students exposed to high-level questioning had to recall facts and data and then rework and accommodate these data subsequent to responding." Like most effective strategies, however, high-level questioning seems to draw diminishing returns if used almost exclusively. The National Science Teachers Association reports that student high-level response actually appears most often when the teachers ask near equal amounts of high-level and low-level questions. Just as there is an optimal balance for high- and low-level questioning in a classroom, a balanced selection of high- and low-level software seems the most beneficial. The response level required by the software will reflect the thinking process your child must use to arrive at his or her answers.

If your goal in selecting software is to stretch your child's intellectual development by requiring analysis, synthesis, and evaluation, then the questions and responses asked by the computer must also be open-ended. In the case of your home computer, the software you select can have the power to "ask" higher-level questions to enhance your child's intellectual development.



Some software will be closed-ended—demanding a single correct response—while other software will be open-ended—accepting a multitude of responses. Either type of software is valuable and worthwhile, depending upon the educational goal in mind for that particular software.

The ATARI LOGO Language™ is perhaps the most open-ended software you can buy for your child. A computer language is not a game or a specific program. Instead, a language is a vehicle by which your child can program the computer to perform numerous functions. ATARI LOGO is only one of several computer languages your child could learn, but LOGO was designed specifically for children. ATARI LOGO stresses problem-solving, discovery, experimentation, and self-directed learning.

One feature of ATARI LOGO is something called “turtle graphics.” To make graphics, ATARI LOGO changes the cursor into the “turtle,” a small triangle on the screen that responds to commands. With just a few commands (FORWARD, BACK, RIGHT, and LEFT), the child can program the turtle to draw shapes. For example: FORWARD 50, RIGHT 90, FORWARD 50, RIGHT 90, FORWARD 50, RIGHT 90, FORWARD 50, creates a square. FORWARD and BACK move the turtle a certain number of “steps” (50). RIGHT and LEFT change the direction of the turtle. RIGHT 90 would command the turtle to make a 90° turn to the right.

The turtle is capable of drawing a simple shape or a complex design depending upon the child’s instructions for number of steps and angle degrees. Once the child makes an initial picture, he or she can build on it and create something new. For example, she can start with a square and add a rectangle and circles to make a truck. Through such experimentation, children often discover directly and concretely the meaning of such abstract geometrical concepts as “angle” and “degree,” and they are forced to reformulate problems into logical, step-by-step procedures.

Turtle graphics definitely provides immediate feedback for the child’s efforts as the child sees the turtle following the commands. He or she can choose to use colors for the background or for the picture and if the picture is not what the child intended, the screen can be cleared and the child can try again.

Delta Drawing by Spinnaker Software is another open-ended program for children. It enables them to create colorful drawings while learning about computer programming. The screen is used for graphics and for text. A child draws pictures in the graphics mode or writes programs in text and can switch back and forth between the two modes. Programs can be saved on a disk; both drawings and programs can be printed if you have a printer. *Paint*®, another open-ended program, encourages creativity and experimen-

tation with color. *Paint* is published by the Reston Publishing Company, in conjunction with the Capital Children's Museum in Washington, D.C.

Spinnaker Software's *Snooper Troops: Case #1 The Granite Point Ghost™* and *Case #2 The Disappearing Dolphin™* is intended for children aged 9 to adult. In *Snooper Troops* children learn to take notes, draw maps, and classify and organize information as they play detective to solve a mystery. The gifted primary student may learn to master this program, although it would prove a source of frustration for the typical primary grade-aged child.

READING

Written instructions on the computer screen provide a reading exercise for primary grade children. Boys and girls are anxious to read the instructions so they can master the activity. We find children just beginning the first grade, quickly learning to read words such as "Find the butterfly."

The primary grade curriculum in reading includes phonics lessons, sight vocabulary, and reading comprehension. Phonics lessons usually include learning the sounds of initial consonants, initial consonant blends (such as br, gr, gl, fr), short and long vowel sounds, final consonants, and four initial consonant digraphs (which are the new sounds created by ch, sh, th, and wh). *Rhymes & Riddles™* (Spinnaker Software) addresses phonics. It is a letter guessing game that helps children with reading and spelling by associating letters to words they already know. This game features riddles, famous sayings, and nursery rhymes. Such software requires children to memorize letter sounds, comprehend their relationships to words, and apply what they have learned to additional words provided by the program.

There are over 300 words children need to quickly recognize in order to read fluently. Many of these words evade easy phonics lessons—they simply must be memorized. *Story Machine™*, with a dictionary of 40 sight words, assists children in memorizing such words. This program will be discussed more thoroughly under the heading "Language Arts" since it is also an open-ended program wherein children creatively write their own stories. *Minicrossword®* (Program Design, Inc.) tests children's sight vocabulary in over 500 computer-generated puzzles.

Reading comprehension is often categorized into seven basic groups: drawing conclusions, cause and effect, finding the main idea, sequencing, inferring, details, and context clues. *Ab*, Dorsett Educational Systems, offers 16 tutorials using stories and articles to develop comprehension skills for grades three through six.

LANGUAGE ARTS

We mentioned that *Story Machine* aids children in developing their sight vocabulary. But perhaps more important, *Story Machine* enables children to have a “hands on” approach to creative writing, while becoming familiar with the computer keyboard. With *Story Machine*, children write their own stories using 40 sight vocabulary words, and then watch their stories come to life in color graphics and sound. These stories can be saved on a disk for retrieval at a later time.

Programs such as *Story Machine* offer skill development in several areas. For instance, it teaches primary grade children basic grammar: correct sentence structure and parts of speech. Children suddenly have a clear reason to know that a noun is a noun, and that a singular subject requires a singular verb. And because the program allows for a multitude of responses, it challenges the child to exercise higher levels of thinking.



BANK STREET WRITER™ (Broderbund Software, Inc.) can also aid children in writing fluency. It is actually a word processing system, simple enough for third graders to use. This program was developed by a team from New York City's Bank Street College of Education and a software development firm in Watertown, Massachusetts.

For language fluency on a computer, typing skills are a must. *Master-Type*® (Lightning Software) is an excellent typing instruction game with

color graphics. Although responses are either “right” or “wrong,” what could be a very dull drill and practice comes to life with color, and motivates children by challenging them to “win” the game.

Memorizing the correct spelling of words also enhances a child’s writing fluency and helps children quickly recognize words while reading. *Let’s Spell*® (Program Design, Inc.) structures a child’s memorization of 90 basic spelling words.

MATH

In the primary grade curriculum there are five basic strands in mathematics.

- 1) **NUMBER.** Accounting, greater than and less than, addition, subtraction, multiplication, division, fractions, positive and negative numbers.
- 2) **NUMERATION.** Names of numbers, place value (hundreds, tens, and ones), the concept of zero, ordinals (first, second, third), rounding to the nearest number.
- 3) **MEASUREMENT.** Money, linear measurement (cm and inches), time (clocks and calendars), volume (pints, liters), temperature, weight.
- 4) **GEOMETRY.** Points (finding a point on a grid and identifying it), ordered pairs (plotting pairs in graphing), lines, angles, shapes.
- 5) **SETS AND LOGIC.** Intersection, union, subsets, disjoint sets, problem-solving.

There are several software programs available that teach “NUMBER.” *Big Math Attack*® (T.H.E.S.I.S.) uses an exciting arcade format, encouraging children to memorize basic math facts in addition, subtraction, multiplication, and division. The screen displays a city skyline while a moving rocket launches an “equation bomb.” Students must give the correct answer before the bomb plunges into the city. *Addition with Carrying*® (Program Design, Inc.) uses sound and color to help foster an understanding of this difficult math concept for primary grade children. *Guess the Number* (EDU-SOFT) aids children in comprehending the concepts of “greater than” and “less than.” The computer thinks of a number between one and ten and asks the player to guess it. A guess either “sinks” or “floats” depending on whether the secret number is larger or smaller. This

program can be customized; for example, the number selected can be between one and 500.

Bumble Games™ (The Learning Company) is beneficial in two mathematical strands: NUMBER and GEOMETRY. Using a grid and direction commands, children create their own dot-to-dot pictures. They must strategically plan ahead to finish a picture as they imagined. This is an open-ended program that demands a variety of skills. It requires children to count to ten, understand concepts of “greater than” and “lesser than,” to plot number pairs on grids, and to develop spatial awareness.

Another program that encourages skills in the area of GEOMETRY is *Spatial Relations*® (T.H.E.S.I.S.). This teaches the relationships of “up/down,” “in/out,” “left/right,” “over/under,” “big/small,” “tall/short,” “high/low.” Spatial awareness may also enhance a child’s ability to memorize word shapes in his or her reading sight vocabulary.

Two programs developed to stretch the mind in the strand of LOGIC are *Creative Play: Problem Solving Activities with the Computer* and *Reverse*. *Creative Play*, developed by the Math and Computer Educational Project at the Lawrence Hall of Science, Berkeley, California, is a bilingual program with puzzles and strategy games. Enrichment activities without computer uses are listed for the games. *Reverse* (EDU-SOFT) is a strategy game using digits. The object of this game is to unscramble the scrambled digits.

EVALUATING SOFTWARE

Children’s learning is not completely orderly and linear. Their learning is more like a spiral, each child moving at a slightly different and irregular pace. There is certain learning that also seems to be strictly developmental. At a certain stage, you may be beating your head against the wall when you try to tell a child that *one* candy bar weighing 2.5 ounces is more than two candy bars weighing one ounce each. Because children’s learning develops and is taught at different rates, some publishers tend to write the educational goals of their programs, rather than simply to attach grade level numbers.

The educational goals listed by the publisher should complement your child’s learning at school, since the curriculum of your child’s school is arranged in steps, while all thinking skills are exercised throughout the curriculum in varying degrees of complexity. Carefully selected software can sharpen your child’s thinking skills and build upon those skills that already have a base. The more information you have about your child and your child’s school, the easier it will be to make an intelligent software selection.

You may wish to begin your software selection with a visit to your child's school to discuss one or more of the following questions:

- 1) What is the first-, second-, or third-grade curriculum at your child's school?
- 2) What are your child's current capabilities?
- 3) What are your child's needs in view of the school curriculum?
- 4) What is your child's learning style? (i.e., Does your child learn best with a great deal of repetition? Is your child a self-motivated learner? Is your child willing to take risks? Does your child prefer a tight structure? In what ways does your child become frustrated? What level of frustration can your child tolerate and still feel successful?)
- 5) What are your child's interests at school?
- 6) What kind of computer program does your school offer?
- 7) What kind of software does the school own? Can you check out software from the school?

Once you have decided upon some educational goals, the next step is to preview the available software. As you preview the material, ask yourself some of the following questions:

- 1) Does the software correspond with the educational goals listed?
- 2) Is the program easy to use? Instructions should be clear, logical, and self-paced so your child can use the program independently after a few trials. Make sure the purpose of the software is not lost in complicated directions.
- 3) Does the program have an element of play? Are the graphics visually appealing and in color? For children to choose to work on the computer, the program should be playful. Color is an important part of primary grade life.
- 4) Is the program success-oriented with immediate feedback, or is the program punitive? It is best to have a success-oriented program with immediate feedback and a gentle "try again" approach to wrong answers. You may want the number of possible wrong answers to be limited if your child becomes easily discouraged. Also, beware of programs in

which the response for a wrong answer is more gratifying than the response for a correct answer!

- 5) Does the program have enough variety to maintain the child's interest? Is it open-ended to span a range of skills? Software that is primarily for drill and practice on a specific skill (i.e., memorizing addition facts) is valuable. However, it should be intended for short periods of time. To get the most mileage out of the software you buy, choose programs that include a range of skills. Software that is not challenging can quickly become boring. Many children will choose LOGO instead of games, because of its variety and interactive possibilities.

CONCLUSION

The computer can provide your child with active learning opportunities. Because you want your child's experience with the computer to be effective and rewarding, software must be carefully selected to meet *your* child's needs, capabilities, and interests. Please keep in mind that children's environments and learning styles vary greatly and that a simple grade level is only an estimation. Your child is an individual, maturing at his or her own rate. Computers can provide the appropriate stimulation for intellectual potency that is challenging, not frustrating, to *your* child.

The best way to make a wise software selection is to first "know your child" and explore your child's educational purposes for the software in terms of your school's curriculum, and computer program as well. Next, preview software that suggests it may provide the educational goals you are seeking. If you desire drill and practice in spelling or mathematical operations, then you may select programs similar to *Let's Spell* or *Big Math Attack*. If you wish your child to exercise higher-level thinking skills, you may select the language ATARI LOGO with turtle graphics, or a language arts word-processing system similar to *BANK STREET WRITER*.

Just as a classroom teacher strives for a balanced questioning strategy to elicit convergent as well as divergent thinking, you will probably choose to have a collection of software that also encourages your child to respond to the computer with a variety of cognitive levels. To encourage your child to reach his or her intellectual potential, include both low-level (requiring a single response) and high-level programs in your software collection.

To make your selection of software easier, gather all the information necessary to be aware of your specific purpose, and match that purpose to the software. You will have fun previewing the many software programs now available. Then enjoy watching, working, and playing on the computer *with* your children!

6 **Learning Basics with the Computer: Grades 4–6**

by Mary Wallace*

Computers are an important part of the learning environment for middle-level elementary schoolchildren (grades four through six). Nine-, ten-, and eleven-year-old youngsters have had enough time at the computer to be comfortable with the keyboard and confident in the operation of software. In addition to their work at school, these boys and girls can use computers in their homes independently and without supervision.

The question is not “Will they use computers?” but “How will they use computers?” The challenge to parents is to make sure the time their children spend on computers at home is worthwhile. The home computer is where kids may sharpen skills already learned, learn new skills, or draw upon their knowledge to make correct decisions in simulations and problem-solving activities.

As the knowledge and experience of the children increase, they are exposed to a greater variety of programs. Games, tutorials, simulation drills, and stories are some of the different types of experiences available on computers today. Although a piece of software purchased for your children may have a title implying it focuses on math, history, or language arts, in using software a youngster is in fact using many skills.

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With a software program you may think you are learning only one thing—but you usually get even more.

In playing a game, for instance, not only will your child be reading instructions for content, but he or she will also be reading clues and phrases as rapidly as possible in order to win the game. When entering responses into the computer your child will be learning the location of keys on the keyboard, and developing small muscle coordination as he or she fingers the keys. Vocabularies increase as kids are exposed to materials written by different authors. In addition, an entirely new group of words comes into use as children begin to refer to computers. “Boot,” “run,” “enter,” “new,” “disk,” and “list” are words that will have new meanings. Further, a youngster who “doesn’t care for” math may have more motivation to do the calculations in a social studies simulation.

If youngsters are accustomed to playing arcade games on the computer, they may resist educational software at first, fearing that it will not be “fun.” They soon find that is not the case. Many kids tire of an arcade game once they figure out how to play it, but not so with good educational software. When children start using their heads as well as their hands, they experience much more enjoyment.

LEARNING IS CHILD'S PLAY ON THE COMPUTER

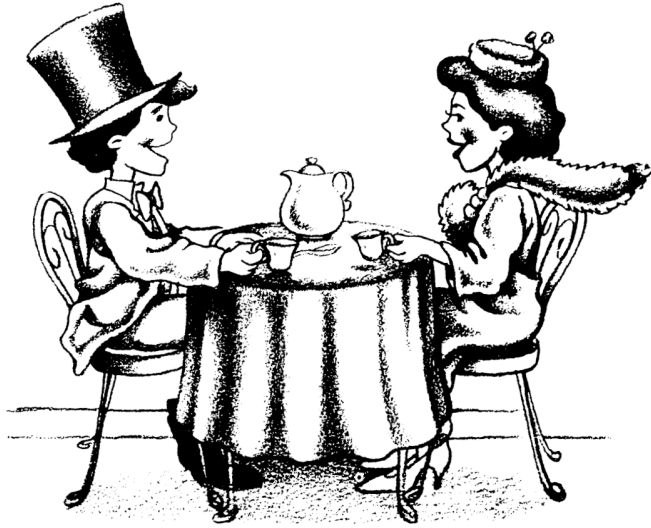
Computers can add a new dimension to the learning experiences of children. The software available today covers a wide range of skills including music, typing, math, spelling, logic, and problem-solving. Every time a child sits down to use a computer, or merely watches someone else using it, many basic skills are learned, reinforced, or discovered. In addition to the subject matter of the software, boys and girls are learning typing skills, small muscle coordination, reading, and how to interact with a computer.

I was amazed to watch two girls in the third and fifth grades play *States and Capitals*[™] (Atari, Inc.). In this game a map of the United States comes up on the screen and the outline of one state is highlighted in flashing color. The user gets points by correctly identifying the state. If the state is incorrect, the correct name comes on the screen; the user then gets another chance to score points by correctly naming the capital. Neither girl really knew the capitals of many of the states, and neither could identify a state when its outline was highlighted on a map of the United States.

After a few frustrating tries, the younger girl left the computer. The older girl got a piece of paper and diligently began writing down the capital of each state. The fifth grader was doing exactly what the game's author had intended. She wanted to score points, and eventually did so, but in the meantime had the valuable experience of carrying out some kind of note-taking procedure, writing down all of the states and their capitals, and then typing them in when requested by the computer. The second time around, she got every capital right, and was quite proud of herself. The younger girl subsequently returned; they never tired of playing the game or getting 100% scores by referring to the list the older girl had made. Later these girls enjoyed impressing their friends with all of the capitals they knew.

A game with the identical format, *European States and Capitals*, is also available from Atari, Inc. A criticism of these games is that some of the smaller states and countries are difficult to identify on the map. Nonetheless, this software would certainly be appropriate for elementary schoolchildren.

By providing their children with resource materials, parents can increase the educational value of software. Paper, pencil and a dictionary are logical items to have near the computer. For the two geography-oriented games mentioned above, parents can encourage a child to sketch a map or provide an atlas as a reference book.



"We're going to Bucharest this season. It's the capital of Romania, you know."

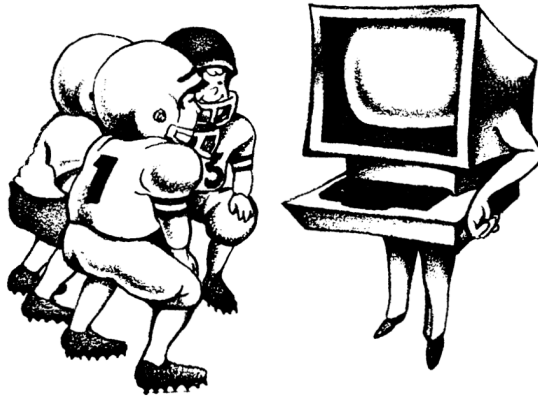
It is a good idea to review any software when it is first brought into the home with regard to what you as a parent can do to make the software more useful. After games have been used by your children for a while, you should check again to see if there is something that was unneeded at first, but might be useful now that they are more familiar with the play of the game.

Programs such as *States and Capitals* primarily involve recall of facts. Although remembering facts may not be considered an especially high level of mental activity compared with reasoning and drawing logical conclusions, the related skills developed in using these programs certainly make them most worthwhile.

Another program based on recall is *Presidents of the United States*[™] from Atari Program Exchange (APX). In this program the player has two choices as to the type of game to be played: either multiple choice or fill-in-the-blank. Multiple choice gives four clues before kids must select the correct president from a list of four men. The fill-in-the-blank version is quite difficult. Again, four clues are presented, but then the user must supply the name of the president. The clues include the dates of office, party affiliation, and major achievements. An aspect of the *Presidents* program youngsters enjoy is the playing of the Star Spangled Banner at the beginning of the program, to accompany a beautifully drawn American flag. The music is also repeated with each correct answer. Wrong answers in this program

merely cause the computer to reveal the correct answer. This American history is a part of third-, fourth- and fifth-grade curricula. Many of our fifth graders confused presidents Theodore Roosevelt and Franklin D. Roosevelt the first few times. After they straightened this out, and learned a few more presidents, they were excited to play the game and show off their newly-acquired knowledge.

Although these games are generally suitable for middle level elementary students, they can also be enjoyed by older youngsters and adults. This type of game encourages discussion and collaboration on answers. Youngsters will discuss why a certain answer is correct, based upon facts they have learned at school or facts they remember from playing the game before.



This type of game encourages discussion and collaboration on answers.

Edu-Ware Services, Inc. has a series of software packages covering arithmetic operations with whole numbers, fractions, and decimals—all of the arithmetic skills taught in elementary school. It is called *CompuMath™*. Each disk offers an assessment test of the skills covered and drills (including instruction) on the various operations. The programs include good explanations on how to do the operations—rare for math software. Although the software is quite comprehensive and employs good text and graphics displays, it does not allow the youngster to respond often enough in the explanation part; consequently kids may become bored before they get into the drill part of the program. For students who need an introduction or explanation, however, it is great. Fourth- and fifth-graders can become quite comfortable with decimals before they are actually introduced in a regular arithmetic class.

A math skills program students like because of its game orientation is *Big Math Attack* by T.H.E.S.I.S. It drills on addition, subtraction, multiplication and division facts. Youngsters choose between two levels and then must give the answers rapidly. Fourth- and fifth-grade boys and girls really like this game, but it is appropriate also for older children, especially if they need the drill on arithmetic facts.

In *Big Math Attack* a space ship drops numbers, and the user must type in the answer before the numbers drop onto the city below. If the correct answer is typed before the numbers fall to earth, the player gets a point. Children find the program very rewarding: each correct speedy answer causes a dramatic change on the screen in addition to the points scored. This is a piece of software that three or four children can enjoy. Even though only one is answering at a time, it is quite common for others to stand around and give encouraging remarks. The bystanders are frequently learning as much as the player. This is a multiple skills piece of software where arithmetic facts, typing and small muscle coordination are all enhanced.

An enjoyable program that teaches important skills is *What's Different*® (Program Design, Inc.). The format is very similar to the questions asked on the California Test of Basic Skills (C.T.B.S.), the most widely used skills test in the United States. The program lists four words, one of which is different. For example, it might give DOG, CAT, POTATO, RABBIT. The player selects the nonmatching word. In this game the player selects correct answers as well as the level of difficulty by using a joystick. Not everyone likes the joystick at first, but with a little practice kids learn to manage it easily. In fact, it is often preferred by those who have poor typing skills or poor small muscle coordination.

In the example given above the player sets the pointer to "potato" and wins points for the correct answer. A message such as "Correct, 'potato' is not an animal" is displayed on the screen. The message teaches too, for sometimes a child will be able to group words together without actually being able to state the reason why they are similar.

There are ten levels of difficulty in *What's Different*, so it can be challenging for gifted junior high students, as well as middle-level children. In addition to learning new skills and enjoying themselves, players of this game become accustomed to the format of the important C.T.B.S. test.

Many nine- to eleven-year-old girls and boys have good enough small muscle coordination to learn to type. A fantastic piece of game style software for teaching children (and adults) to type is *Master Type* (Scarborough Systems). I was amazed at a fifth grade southern California boy who had been using this program at home for two weeks. He could actually type in

many short words using the home positions and a few keys above and below.

There are many levels to *Master Type*. Starting at level one, the players are instructed to place their hands in the base position on a typewriter. The first level teaches which keys are touched by the index finger in "home" position. With hands on the keyboard and eyes on the screen, the player is asked to hit the key under the left or right index finger in order to stop the firing of an alien space fighter who is attempting to destroy the player's "shield." The motivation to learn is tremendous!

But if you "cheat" and go on to a level too difficult before perfecting the previous level, you will be incapable of doing the exercise. This program looks like nothing more than an arcade-type game, but those who have to take their eyes off the screen to look at the keyboard lose points and time; thus players are rewarded for memorizing the keys and not looking down. This is another game where youngsters who are not the active participants enjoy looking on.

A month after I observed this fifth grade boy working on *Master Type*, I received a letter from him entirely written on the word processor and printed out on the printer. The handwritten envelope appeared to have been tediously inscribed, whereas I'm sure he had fun on the word processor typing the letter itself. What a marvelous skill for a fifth grader to have for the rest of his life!

There are historical simulations on the market today that focus on a unique period in history such as the Civil War, gold rush or the westward migration. Most of these are extremely well researched to the point that the incidence of snake bite, death by drowning or starvation occur in the precise ratio that they occurred at that time in history! Boys and girls alike really enjoy these games. The history they teach is powerful. So often a history book cites that out of a party of 100 people 45 died of starvation. But that may be just another ho-hum statistic until it is "your" person who actually dies or suffers from a hardship often difficult to comprehend by a typical twentieth century American schoolchild.

A favorite game of everyone from fourth grade up is *Oregon Trail* (Computer Using Educators Softswap). It is a simulation of the covered wagon trip to the West Coast from St. Louis in the mid-1800s. Boys and girls have to think about the value they give to many aspects of life as they allocate their meager budgets for such necessities as food, clothing, medicine, bullets, and oxen. Decisions must also be made whether to travel forward or to stop and hunt for food. Day-to-day survival becomes all-important. The children (adults too) get involved with the game and come away not only with factual knowledge, but with the ability to discuss why they spent their resources and used their time as they did.



Boys and girls alike really enjoy historical simulations. The history they teach is powerful.

In discussing their games with each other, the youngsters refer to the fact that "Billy died of snake bite," and "Marcie died of the flu." These events make it all more real. Everyone is impressed that so few actually arrive in Oregon, unless correct decisions are made. A bit of factual knowledge the successful come away with is that the president in 1847 was James K. Polk. Those who make it to Oregon receive a telegram from him.

Simulations are excellent programs as each time they are played and new decisions are made, a new story unfolds. Children learn history, practice math, and make important decisions based upon their knowledge of past events—all marvelous learning tools.

Word Scramble® by T.H.E.S.I.S. is just one example of the good spelling programs available. Boys and girls love to watch the robot shoot letters out of a gun to form scrambled words. When the player guesses correctly, the robot shoots out the letters again in correct order. This is excellent for recognizing letter groupings as they occur in various words. For instance, most children age nine and older immediately pick out a "t" and "h," if they both occur, as two letters that probably go next to each other in the word. Since the letters are scrambled differently each time, it is a different game each time, even though the words remain unchanged.

Word Scramble may be too difficult for third graders, but it is appropriate for most fourth- and fifth-graders. The younger ones have a better

chance at the game after they have been through it a couple of times and have become familiar with the words. This game is more useful to children if parents sit down and play it with them the first few times, to give them an idea of what to look for in the words. This kind of learning situation is most appropriate for computers; to scramble the letters of many words on a regular basis by any means other than a computer, would be very tedious.

A spelling game with more options is *Spelling Genie*™ from the Atari Program Exchange (APX). Here you can use one of the Genie's nine spelling lists, or type in your own list. There are four different variations of the game, as well as a combination of all of them. The player may use either the keyboard or the joystick to choose options, insert a personal spelling list, and answer the questions. The different variations on the game include "Pop On" where a word briefly flashes on the screen, then the player is to spell it correctly. This is appropriate for younger children, or for older children on the first time through a difficult list. Other options include "Mix Up" which displays the word with its letters scrambled, and "Vowels" which displays the word with blank spaces in place of each vowel. The "Mix Up" option is the most difficult. The "Vowels" option is especially good for third- and fourth-graders. Youngsters particularly enjoy the graphics of the "Whizzer" option where a correct response activates a whirling target. Here is a program to make children really enjoy studying their spelling lists.

Youngsters could use this program to type in their spelling lists on the day it is given, then practice it throughout the week, using the various options on the program's menu. A second list of spelling words that cause difficulty could also be kept. Still another use might be words of particular interest, or words in a foreign language.

PROGRAMMING—ANOTHER WAY OF LEARNING ON THE COMPUTER

In addition to using the computer to increase their skills in reading, spelling, social studies, math and reasoning, children can also learn to program the computer itself.

Computer literacy is part of the curriculum of most junior high schools, and is mentioned briefly in the curriculum of some kindergarten through fifth grade schools. The definition of computer literacy differs from school to school, but generally it includes a familiarity with a computer keyboard, being able to get on and off the computer, and the ability to use soft-

ware. The trend seems to be to include some computer programming at the junior high level.

Nine-to eleven-year-old kids who are comfortable with the computer, find learning about computer programming fascinating. It is often said that one does not have to be an auto mechanic to drive a car, so one need not know how to program to use a computer. But to continue with that analogy, most people who drive cars know a little about the engine so they can have it serviced properly; so, most people who use computers should know a little about programming so that they can better understand what is happening.

Fourth-, fifth- and sixth-grade students can easily learn the programming languages PILOT, ATARI LOGO and BASIC. In these languages, the children learn how to make the computer print out simple messages, do tasks repetitively, make decisions or draw pictures ("graphics"). Youngsters are highly motivated to do these graphic displays and can learn many good programming techniques through graphics.

SELECTING SOFTWARE FOR THE MIDDLE-LEVEL ELEMENTARY SCHOOLCHILD

By the time children are nine years old, their own experiences, capabilities and educational success (or failures) differ widely. Although most software manufacturers attempt to describe their programs and specify an appropriate grade level, parents can only use that as a very rough guide.

Children may find a variety of learning experiences in computer software. Some overtly educational software is of tremendous help in supplementing classroom experiences. Some programs designated as "games" are rich in opportunities for reasoning and logical thinking. Some programs (of either type) offer only mild diversion. One rule of thumb I use is to observe children as they play with a program. If the program leads to discussion and interaction as the youngsters try to determine how best to succeed, then the program has educational value.

Here are some general guidelines for all software, and specific guidelines for educational software. Some general guidelines are:

- 1) Software should use the graphics and sound capabilities of the computer, and not just display printed text on the screen. Many software manufacturers have the option of sound or no sound in their programs. The ability to turn the sound off is desirable if the computer is to be used in a room where it might disturb others.

- 2) Programs should be able to be used by children and adults with a wide range of abilities. Purchase programs where you may select the level of difficulty at the beginning of the program, or where the computer adjusts the level of difficulty according to the number of correct responses. *Monkey Up A Tree™*, available through APX, is a good example. Each of the two players starts out on an elementary-level of difficulty, but the problems presented increase in difficulty with speedy and correct answers. On the other hand, if a player fails to respond correctly on the easiest level of arithmetic problems, he or she remains there until successful. The user who succeeds at the easiest level will be given increasingly more difficult work. Each correct answer is rewarded with the monkey climbing a few more inches up the tree. Finally the monkey plucks a banana, slides down the tree, and eats the fruit. A first- and sixth-grader could play this game, and each would have an appropriate level of difficulty.
- 3) Programs with only one list of “correct” answers do not have the staying power of more versatile programs. Many spelling programs allow the student to type in a new list of spelling words every week. With such a program the student practices the words when first typing them in, and then again as he or she plays the game the computer makes with the words.
- 4) Programs that allow the selection of different options within the game or the selection of a difficult level are more interesting. Children like the sense of power they get when choosing their own options. Software will be used more often if it can be played in a variety of ways.
- 5) Instructions should be very brief or not necessary at all. Most kids are eager to get into the program and do not want to “waste” time reading instructions.
- 6) Software should allow frequent input from the child. That is, she can type in a word, hit one special key, or use a joystick.
- 7) There should be rewards for correct answers but no unusual displays for incorrect answers. A program in the early days of educational software featured a firecracker with a burning wick. Each wrong answer caused the wick

to get shorter until the firecracker exploded. Everyone (adults included) wanted to see the graphics of the explosion so no one tried to get a correct answer. A wrong answer should not be accompanied by an exciting graphics display or loud noise, letting everyone around know the answer was incorrect.

- 8) Consider whether the software can be used by more than one person at a time. There is need for software that can be used by only one person, as well as for software that permits multiple users.
- 9) In addition to considering the age and ability of your child, parents should also take into account the sex of the child. Recent studies suggest that girls and boys prefer different types of programs. Boys enjoy a format where they can be more aggressive. Girls seem to prefer word- and music-oriented programs.
- 10) Parents might want to consider the nature of the reward given for correct responses in a program. Usually it is the accumulation of points or treasures; sometimes this is accompanied by graphics displays. Occasionally there will be rather violent graphics that might be objectionable.
- 11) Ask to have the software demonstrated in the store.

Some specific guidelines for educational software are:

- 1) Consider the reading level of the program. If it is slightly difficult for a child, he or she may “grow” into it. If it is far too difficult, he or she will never use it.
- 2) If a child needs remedial help, some software that is excellent for drill, may be inadequate for basic understanding. Usually a child who requires additional help will need a combination of drill and instruction. The computer may be the best option to use for drill, but another medium might be better for instruction.
- 3) Check with your child’s teacher about the software used in school. You may want to use some of the same software at home.
- 4) Make sure the finger dexterity required for a program is not too difficult for your child. If rapid typing of words is re-

- quired, and the youngster is slowed by chubby little fingers, then the software may be too difficult at the present time.
- 5) Be sure the instructions accompanying the program are adequate.
 - 6) Consider the length of time to complete a game. If a game takes 45 minutes to complete and your child's attention span is 30 minutes at best, then this program is not for him or her.
 - 7) Look for programs where the child can type in his or her own spelling list, and for programs where the speed of the text displayed on the screen can be slowed down.
 - 8) If logic and problem-solving are involved, make sure the work is at a level appropriate for your child. A clue to this may be the instructions. If a child does not understand the instructions, then he or she may not understand the game either.
 - 9) Many educational programs have a screen display at the end that will indicate how many problems were correct, how many incorrect, and the nature of the errors, if any. If used properly, this can be valuable.

Most of the software available in department stores and computer stores is not of an educational nature. Where does one purchase this software? Most of it is available through companies that supply schools. Those educational software companies advertise through their catalogs and in magazines designed for teachers who use computers. The Appendix of this book has a list of software distributors and their addresses. Also read the section on Public Domain Software in the chapter, "The Family Who Plays Together, Learns Together."

Inside Arcade Games

by Tracy Deliman,*
Jim Conlan,**
and
Jjago Zamora***

Almost all 12-year-old kids like to play arcade games.¹ Arcade game playing is the fastest growing extracurricular activity in the country. The games are compelling, and kids can play them for hours on end. The games are so absorbing that kids even skip school and spend long afternoons (and lots of money) playing, often to the annoyance of parents and teachers. Arcade games have been criticized for being psychologically addictive, physically dangerous, too expensive to play and too violent. But critics say little about the actual educational content of the games, or the positive effects that playing has on children. Perhaps arcade games deserve a second look by parents and teachers, especially since they are so compelling to kids. Could there be educational value to arcade games?

Many of the games popular in arcade parlors are now available on the ATARI 400 and 800 Home Computers. Some examples of these games are: *Star Raiders* (the only game on this list that came directly to the home

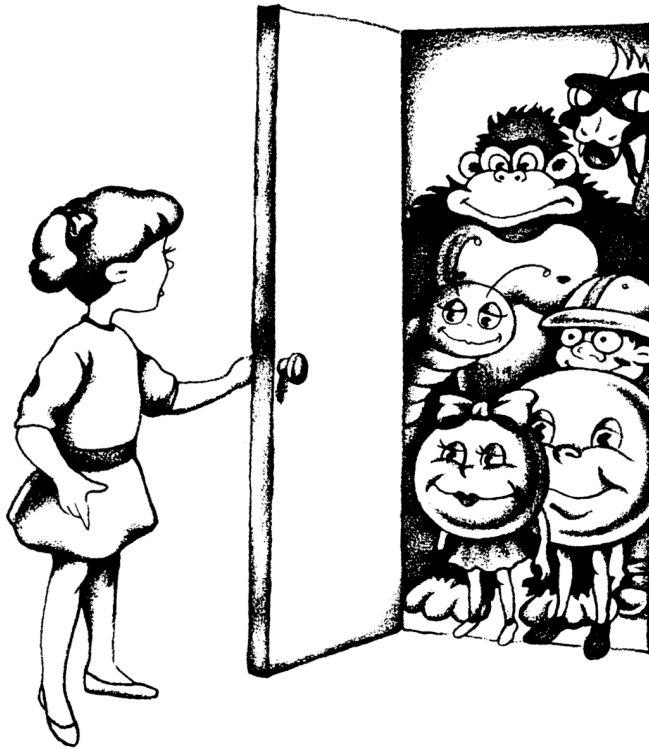
* Tracy Deliman is primarily an inveterate observer of people. She weaves this habit into her work as a writer, anthropologist, holistic health buff, Ph.D. candidate in Transpersonal Psychology, and Buddhist.

** Jim Conlan teaches mathematics and computer science at Menlo College, Menlo Park, California. He is author of four books about home computers.

*** Jjago Zamora, a young man with a flair for drama and humor, is a student at Peninsula School in Menlo Park. His interests include baseball, music, computer games and coin collecting.

¹ Some games available for the ATARI 400 or 800 Home Computers are the arcade-style games, familiar to everyone. However, they only reflect a portion of the games and programs available for the school in your home.

computer without first being played in arcades); *Pac-Man*; *Asteroids* ; *Super Breakout*™, *Donkey Kong*™; *Missile Command*; and *Centipede*™. The first four of these games will be analyzed and discussed in this chapter.



"Come in and play."

Usually, home computer versions are not as colorful or as much fun as arcade versions because of memory limitations; but the games are exciting to kids nonetheless. By the time this book reaches your hands, there will be about one million ATARI Computers in homes; most of them will be owned or used mainly by kids. So, you can bet the home computer versions of arcade games will be played even more heavily.

WHAT THE GAMES DO

Educational researchers, teachers, and parents have begun to closely examine these arcade games for possible inclusion in the school curriculum.

Perhaps the games have some intrinsic value that is not immediately obvious. Most arcade games share several characteristics that make them intriguing to kids and adults alike.

- 1) They demand fast, complex motor coordination. The player has to quickly perform certain operations to succeed.
- 2) They involve rapid decision-making. The player must view the situation, decide on a strategy, and play quickly.
- 3) Success or failure is immediately apparent. Within split seconds, the player can see colors change, events occur, or hear sounds that tell the player what happened as a result of the move he or she just made.
- 4) The goals of the game are simple and clear.
- 5) The levels of challenge vary, generally increasing as the player gains proficiency.

Taken together, these characteristics are conducive to learning, so whatever material exists in the games is likely to be learned fairly rapidly. Also, the material will be retained, especially if the child plays the game repeatedly.

We believe there are two important positive aspects of arcade games to consider.

- 1) **CONTENT**—the actual information built into the game that the player learns through playing, and
- 2) **ACTIVITY**—in doing the game, what skills does the child develop and what benefits does he or she gain?

At the same time, there are two important negative aspects of arcade games to consider.

- 1) **VIOLENCE**—Many arcade-style games express themes of war or violence. How does this affect a child in his or her life and in learning?
- 2) **EXCLUSIVITY**—Since the games are so compelling, indeed almost addictive, will kids play them to the exclusion of socializing and other valuable activities?

CONTENT

Examining the content of a game requires playing the game, watching kids play, analyzing the information buried throughout the game and analyzing the things a child has to figure out to succeed at the game. *Star Raiders* was one of the first games available on the ATARI Computers and is among the richest in content. As the player, you cruise through space looking for Zylons who are attempting to destroy you and your Star Base. Your job is to protect your Star Base and destroy all the Zylons in the galaxy. At any time, you can take a look at the Galactic Map to see which quadrants of the galaxy contain Zylons, where your Star Bases are, and where you are. Then you can travel to a particular quadrant for action. There are four levels of proficiency in *Star Raiders*: novice, pilot, warrior, and commander. Each succeeding level requires greater proficiency at maneuvering and aiming, and has a greater complexity of things to remember and coordinate.

The game provides a realistic feel for flying through space—scattered stars and meteorites come toward the player and veer off quickly to the sides. In maneuvering the cruiser ship, the player uses all the dimensions of a real spacecraft: flying up, down, to the left, and to the right. With repeated playing, the child can become proficient at maneuvering quickly and accurately. When a child reads the Galactic Map, he or she gets a macro view of the entire galaxy; the galaxy is depicted on a grid with each square representing a quadrant of space, much as a real map might show. Also, the player has a limited quantity of fuel and must keep track of the energy meter at the bottom of the screen, even while continuing to track Zylons, and return to a Star Base when fuel runs too low. The player also returns to the Star Base whenever serious damage has been done to the cruiser ship. At the Star Base, the cruiser ship refuels and has repairs made, then goes back out into space.

To make contact with the Star Base, the player must first locate the Star Base in the forward sites with precise accuracy, then align the cruiser ship to zero on the *phi* and *theta* symbols. These symbols of the Greek alphabet represent the angle of azimuth and the angle of elevation (though the player is not explicitly told their meaning), which are means of locating an item in space. If the cruiser ship moves too far off the zero, a negative number shows up; too far in the opposite direction and the number is positive. The cruiser ship must also change velocity until orbit is established with the Star Base. Then, a little shuttle comes out from the Star Base and contacts the cruiser ship, completing refueling and repairs. After refueling, some players like to blow up the Star Base, just for the fun of it. (Most kids

who play this game are boys; boys frequently blow up the Star Base, girls usually don't.)

Star Raiders provides a fairly even balance between motor skill and activities and thinking. To do well at the game, the player must be strategic in his or her moves, and must keep the fuel count and other items in mind. Some examples of strategy are: going after the Zylons closest to the Star Base first, using speed changes to make it easier to catch up to Zylons, and, when energy is low but the situation is critical, choosing moves that use the smaller amount of fuel.

* * *

Pac-Man was the most popular arcade game from 1981 to 1982. This game is widely known in arcade parlors, but a version of it is also available on cartridge for ATARI 400 and 800 Computers. The goal of this game is simply to score points and avoid being consumed by ghost monsters. The *Pac-Man* character runs about in a maze gobbling up white dots to accumulate points. The maze also contains four ghost characters that can eat *Pac-Man* unless *Pac-Man* eats one of the four power pellets located in the corners of the maze. When *Pac-Man* eats a power pellet, the ghosts turn blue for a few seconds, during which time *Pac-Man* can eat the ghosts and score an additional 200, 400, 800, or 1200 points per ghost. *Pac-Man* has three lives, so, if a ghost does catch up with him, he still has two more chances.

At random times, one of several types of symbols may appear near the center of the maze. Each symbol is worth a different number of points, gained when *Pac-Man* eats the symbol. The symbols are cherry, strawberry, orange, apple, lime, the Atari symbol, a bell, and a key. To score additional points, *Pac-Man* must quickly zoom over to eat the symbol when it appears. *Pac-Man* is usually played as a one-person game, though it can be played by two people, alternating turns, with scores being counted separately in the upper right- and left-corners of the screen.

We found absolutely no educational content in *Pac-Man*, although the game does involve some strategic thinking. As the player, your *Pac-Man* character will do well if you are familiar with the maze, if you can travel the quickest routes that allow you to devour a large number of dots in a small amount of time, if you can out-manuever the ghosts, and if you can very quickly make your way to the center of the maze when a symbol appears.

The game does require quick responses and skilled, hand-eye coordination to succeed, but this can be gained by nearly anyone who plays the game often. The most outstanding characteristic of *Pac-Man* is that it is delightfully fun. The game is colorful, quick, and lighthearted.

* * *

The popular game, *Asteroids*, was released in July 1982 for the ATARI Computers and has been heavily played by kids ever since. As the player, you are in a spaceship trapped in an asteroid belt where asteroids float about and towards your ship. You must pulverize the asteroids with your ship's photon cannon before they hit you; but you can be hit four times before your ship is destroyed. The asteroids start out large, and as you hit them, they break up into smaller asteroids and move about a little faster. You score points for every hit, with values increasing for smaller, faster-moving asteroids. For every 10,000 points you score, you get another ship. There are also alien robot saucers in the asteroid belt, firing at you at random. Using the joystick, you can turn your ship in different directions and fire. You also can hold the stick towards you to put up a protective screen, or away from you to move out quickly across the screen. To do well at the game, hand-eye coordination must be good and firing must be rapid. Also, up to four players can play *Asteroids*, either patrolling together cooperatively, or playing in combat against one another and the asteroids.

In *Asteroids*, there is very little educational content, with only a minimal amount of strategic thinking required. The player learns the angles and distances from which a moving target can be hit, for slower-moving targets and for faster-moving targets. Even with such a simple structure, kids find *Asteroids* fun and fairly absorbing.

* * *

Super Breakout is another heavily played game. The *Super Breakout* game is structured very much like racquetball. As the player, you face a wall of "bricks" in differently colored layers. You have a paddle that moves back and forth near the bottom of the screen to hit a white ball towards the brick wall. Each time you hit a brick, the brick is knocked out of the wall. As you break through each layer of bricks and expose the next layer, the ball moves faster. This is the simplest level of the game. On another level, there are pockets in the wall that contain additional white balls. These balls are released into play when you break through the layers of bricks surrounding the pockets. *Super Breakout* can be played by one person, or by two people alternating turns.

Knowing the angles of deflection when hitting a ball off walls and toward a specific object is about all that is learned in this game. The better the player knows these angles, the more accurately he or she can place the racket, thus doing better at the game. The player can also put a "spin" on the ball and can "stroke" with the racket. To do well at *Super Breakout* also requires fast hand-eye coordination. *Super Breakout* is an utterly simple game in its structure and, even though it has little content, is a great deal of fun. It is also colorful, fast-moving, and quite engrossing. Lastly, it is non-violent; in fact, it can be peacefully meditative.

ACTIVITY

In playing these arcade games, kids can learn several things. The most salient experience a player gains in most arcade games, certainly in all four games reviewed here, is in exercising motor skills, especially hand-eye coordination. What this simply means, is being able to make a move with your hands according to what your eye perceives and what your mind tells you is necessary. The majority of arcade games contain much more motor-skills activity than cerebral activity. The exception in the group of games discussed in this chapter is *Star Raiders*, since the game is more complex, requires keeping in mind several conditions and uses strategy. *Star Raiders* balances motor skills with thinking. We believe a player benefits most, and is more engaged, when these two activities are well-balanced.

A player also learns to exercise quick decision-making in these four arcade games; but because of the speed of the games, most decision-making is kept at an unconscious level. When two or more kids share the game, they usually tell each other their reasons for making certain moves—then the decision-making process becomes more conscious.

In *Star Raiders*, the player deals with some math, develops strategic thinking under the pressure of time, increases certain motor skills involving hand-eye coordination, and learns to solve a few simple mathematical problems. One of the most positive aspects of the game is that the child is deeply *engaged* in an exciting game experience.

Playing *Pac-Man* provides two things—motor skills and great fun. Although kids often play *Pac-Man* alone, this game is more likely to be shared; so the game is apt to encourage socializing. (It is almost as much fun to watch it being played, as to play it.) *Asteroids* and *Super Breakout* both contain about 80 percent motor-skills activities, with the other 20 percent being situations requiring some thinking about the angles necessary for hitting a target.

All four of these games tend to increase the player's focus and concentration. The games are so fast-paced that the player must be very attentive; disastrous events can occur almost in the blink of an eye if you are not paying attention. Also, since the games are absorbing, attention spans usually lengthen. Finally, with the playing of arcade games and other such games, kids become familiar with the computer, a tool that is undoubtedly essential to the lives of future generations.

VIOLENCE

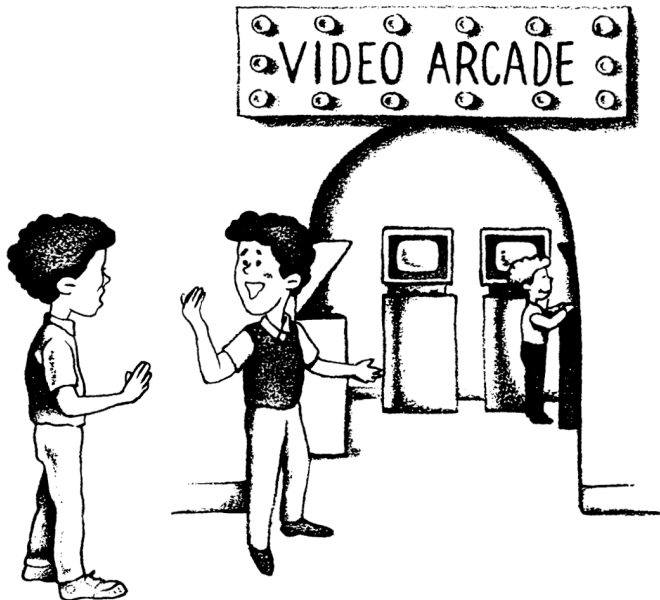
Many people disapprove of arcade games because they express violent or war-like themes. *Star Raiders* is based upon the idea of war in space. *As-*

teroids suggests a “battle” for survival between humans and inanimate chunks of matter floating through space. *Pac-Man* is based upon a theme of eating and being eaten. Although such images certainly do suggest violence, it is important to point out that the violence is usually very abstract—much less realistic or convincing than anything kids can see on television tens, even hundreds of times, daily.

Manufacturers believe that kids (and their parents) are more likely to buy violent rather than nonviolent games. So, the change has to come from both sides: manufacturers and consumers. If kids and their parents want nonviolent games, they need to make their demands known to manufacturers, and stop buying those games that contain violence. Certainly it must be possible to challenge children in countless ways other than with violence, especially the animate, destructive type.

EXCLUSIVITY

Another accusation leveled at arcade games is that kids will become addicted and sit glassy-eyed and alone in front of their computer, zapping aliens. Many of these games are so absorbing that it is possible to play them



“Not today I’m trying to cut down.”

for long stretches of time. It is equally possible for kids to spend hours poring over their bubble gum, baseball card collection or creating dramas with characters in a doll house. Most normal kids tire of any single activity after a couple of hours at most, and want to go on to something else such as riding bikes or visiting friends. A smaller number of kids will be compulsive enough to want to play computer games almost nonstop. These kids may need loving parents to pluck them off the keyboard and take them out to play catch.

In general, though, playing computer games tends to encourage socializing among kids. Most kids would rather play these games with friends or siblings than play alone. Also, kids tend to share the details of the game with one another—what the rules are, what their winning strategy is, or when to expect certain events to happen. Sometimes they compete against one another and sometimes they cooperate; this depends more on the personalities of the kids than on the structure of the game. Whenever possible, kids will change the rules of the game or play it nonsensically if they want.

CONCLUSION

The actual educational value of existing computer arcade games is fairly small, but some learning content and learning activities do exist in the games. There is not usually a significant amount of content material in one field, such as history or geology, to make these games useful in a social curriculum. However, kids do benefit from familiarity with computers, enjoyable and energy-releasing game playing, and socializing. So, at least for these reasons, it is worthwhile to make computer-based arcade games available to kids. In selecting the specific games, parents and teachers need to ask themselves a few questions.

- 1) Is there a lot of violence in the game? If so, what kind? Do we believe it would be harmful for our children?
- 2) Is the game easy to share with others, and likely to encourage our kids to socialize with the game? Or is it a game that a child can play alone?
- 3) Are we willing, as parents and teachers, to be involved with the kind and quality of games our children play on computers, and to balance this activity with other activities in our kids' lives?

Manufacturers and game designers need the input of kids and parents and teachers to develop high-quality games. There are some game designers

now developing educationally rich, nonviolent games for computers. These games will intentionally impart valuable material in an experimental mode. In the future, the quality of games will continue to increase, especially if the buyers insist upon quality.

8 **Adventuring on the Home Computer**

**by Tracy Deliman,
Jim Conlan
and
Fante Zamora***

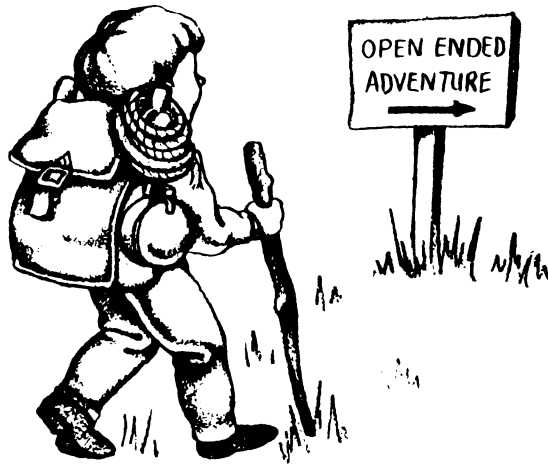
A fantasy adventure game lets the player travel in fantasy to an unknown environment, encounter strange beasts and fight them off, acquire magical objects, and find hidden treasure. There are two kinds of adventure games: the unstructured and the structured. In the unstructured kind, the outcome can vary and the game is played through a character. In the structured kind, the environment and facts of the game are fixed and the player is the adventurer. This chapter deals with the unstructured adventure games, and the next chapter deals with structured adventure games. We examine the educational value in these adventure games.

UNSTRUCTURED ADVENTURES

The adventure games we call “unstructured” or open-ended are based on fantasy role playing, where a created character ventures forth into a world of myths and legends, heroes, magic, wizards, loathsome beasts, swords and armor, and treasures. Traditionally, fantasy role playing games are played as board games, with a gamemaster who creates the environment and events for the other players. Fantasy role playing is a growing subculture, and the numbers of players are increasing year by year. Members of

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the fantasy adventure subculture share a language and lore, and they are bright people, with minds for detail. They have good memories, colorful imaginations, and long attention spans.



COMPUTER ADVENTURES

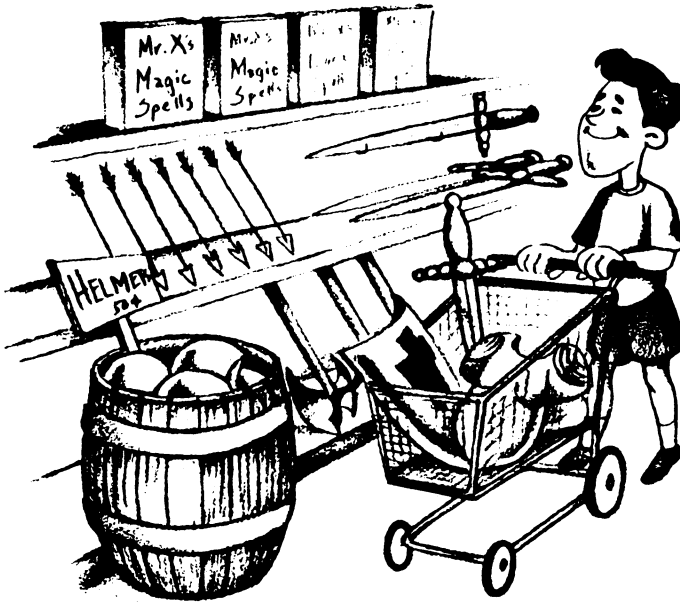
Simplified versions of fantasy role playing games have been adapted for the home computer, and are available on different computers. Although there are many adventure games, published by several companies, in this chapter we will deal with the games produced by Automated Simulations (and distributed by Epyx) in Sunnyvale, California, mostly for the ATARI and Apple Home Computers. These games are: *Temple of Apshai*[™], *Datstones of Ryn*[™], *Morloc's Tower*[™], *Rescue at Rigel*[™], *The Curse of Ra*[™], *Upper Reaches of Apshai*[™], *Hellfire Warrior*[™], *The Keys to Acheron*[™], *Danger in Drindisti*[™], *King Arthur's Heir*[™], *Escape from Vulcan's Isle*[™], and others. The first four of these adventure games are reviewed and analyzed in this chapter.

THE NATURE OF AN ADVENTURE

Almost all of the unstructured adventure games have several characteristics in common. They are as follows:

- 1) The adventure is based on a legend or story line.

- 2) As player, you have a character with a given set of attributes.
- 3) Your character travels in an unknown environment, often a kind of labyrinth.
- 4) Your character carries weapons and other equipment.
- 5) Your character encounters monsters and other adversaries.
- 6) Your character acquires magical objects with special powers.
- 7) Your character searches for treasure and attempts to retrieve it.



Before the adventure begins, the computer gives your character randomly generated values for specific attributes. (In some cases, you can choose the values of the attributes.) These attributes, given in values ranging from three to 18, affect how well or poorly your character can accomplish certain feats. The attributes are: a) strength (physical); b) constitution (health and endurance); c) dexterity (reflexes, coordination, and eyesight); d) intelligence (ability to reason logically and express verbally); e) intuition (awareness and spatial perception), and f) ego (mental toughness and willpower).

In the documentation that accompanies game programs, the legend or story line of the adventure is told. The story usually takes place hundreds of years ago in an unknown, faraway land and is a struggle of good against evil.

Perhaps some villainous creature has stolen some treasure, and the story ends with the treasure still unfound. Your character will search for the lost treasure.

PLAYING AN ADVENTURE

When your character begins the adventure, he (in the computer versions of adventure games, the hero is always male) carries certain resources: gold or silver pieces, weapons, one or two magic objects, and possibly a healing substance. The character ventures into an essentially unknown environment, the details of which exist only in the imagination of the player. As the character explores the environment, he encounters monsters and has to fight them to continue the adventure; the character can flee, but the monster will still be there when he returns. The character also searches for hidden treasure and tries to escape with all of it. As player, you choose the actions your character takes during the adventure. Through your character, you can search for secret doors, magic weapons and special objects; you can fight monsters in a variety of ways; you can heal yourself if wounded, or you can recuperate if fatigued. You can grab treasure when you find it.

There are usually three or four different levels of play in the adventure. Levels increase in difficulty—in the number and kind of monsters encountered, in the kinds of feats your character has to accomplish, and in the rewards you can collect. In some games, if your character is killed he can be resurrected by someone else coming across the body, but you must pay a price for this resurrection. When your successful adventurer leaves the game, he will have acquired experience and wealth that he can carry into the next game.

Temple of Apshai

Apshai was an insect god with knowledge acquired from dark and sorcerous practices. His hive of giant insects once inhabited a cavern by the sea, and exacted a tribute from the villagers of nearby Geb. Apshai's insects accumulated these treasures and constructed the Temple of Apshai inside the giant cavern. The temple was eventually left ruined, but the treasure is said to remain. Legend has it that people in search of the treasure have disappeared in the caverns of the Temple of Apshai. This is where you, the player, come in.

In this game, the Innkeeper (the computer) determines your character's attributes and gives him some silver pieces. Your character can then purchase certain weapons and items to take along. In the adventure, your

character encounters several monsters, mostly giant insects—antmen, ants, centipedes, beetles, leeches, mosquitos—and also rats, spiders, and amoebae. (You can choose among three monster speeds—slow, medium, and fast.) Your character fights them off using sword and shield or magic arrows, as he travels through 200 numbered rooms, each with different types of monsters and treasure within. (The treasure is silver pieces, skull rings, gold ingots, diamonds, rubies and other gems.) You must be constantly vigilant of your character's fatigue level. Every move and every monster fight tires him. To recover energy, your character can do nothing for awhile (which is boring) or he can "search" for something. When your character successfully completes his adventure, he returns safely to the inn and counts all his treasure.

There are four levels of play in *Temple of Apshai*. The lower levels are more dangerous and require more experience. The main difference at the lower levels is that there are more monsters and they seem to attack more ferociously.

In *Temple of Apshai*, the legend is rich and the prospects of the adventure are exciting. By comparison, the graphics and actual events generated by the computer are a great disappointment. Each room appears as a single, two-dimensional rectangle with one to three openings. Your character is a moderately fleshed-out stick figure, and the monsters are vaguely shaped insects. Character movements are simple and awkward. All treasures, regardless of what they're supposed to be, appear as tiny, blinking white squares. All the changing information of the adventure—fatigue level, kind of treasure found, type of monsters, chronology of the battle—is shown in text to the right of the rectangle. In short, the actual environment, events and figures as they appear on the computer screen are crude.

What is Learned

The game basically consists of moving the character through an opening in the room to get to the next room, fighting monsters when they appear, searching for things, and grabbing treasure when it is found. The content has limited educational value: A player will learn the vocabulary used in myth-making and legends, and the player does need to do some strategic thinking when fighting monsters and using resources. Monsters can only be struck within a certain proximity, and the player should know when one kind of attack would be more successful than another. Energy and magic arrows are exhaustible resources, so the player must use them sparingly whenever possible. There are also catches to using some items, such as magic arrows, and conditions under which a strategy will or will not

work. In playing this game, a child gains practice in holding several details and conditions in mind while pursuing some specific goals. Also, the rooms connect to one another, so a clever player can draw maps, either mentally or on paper, of the entire temple.

Datestones of Ryn

Ryn is a proud duchy that houses its ceremonial regalia in a tower. Ryn's most valued treasure, the datestones of the ducal calendar, were stolen by Rex the Reaver, a powerful robber barron, and his band of cutthroat thieves. The thieves fled to some nearby foothills and hid in a dark, dangerous cavern. Your character must search the cavern to retrieve the datestones and kill Rex the Reaver.

Datestones of Ryn is a much shorter adventure than *Temple of Apshai*, containing only about 30 rooms to explore rather than 200 or so. Its playing time is about 20 minutes. The main adversaries in Ryn are thieves, though there are also wolves, bats and rats. The specific goal is to recover the datestones, and an extra goal is to find and kill Rex the Reaver (Rex is worth more points than the datestones.)

What is Learned

Datestones of Ryn is very much like *Apshai* except that it is a much smaller game, has a specific goal and a definite time limit. The character travels from room to room in the labyrinth, searching for treasure and fighting foes. Again, some strategic thinking is required. It helps to develop the ability to remember details, such as which monsters were in which rooms. Map-making is one possible educational activity, since the rooms connect.

Morloc's Tower

Morloc is a mad wizard whose tower sits on a hill overlooking the village of Hagedorn. Legend has it that he was crazed by one of his own fireballs. In his madness, Morloc is gradually destroying Hagedorn by burning its buildings, one by one, with fireballs. No one has yet been able to stop him, and soon Hagedorn will be nothing but ashes. Your character's primary task is to find Morloc and kill him. Secondly, your character can collect some of the magical treasure of the tower as he goes through the adventure.

Morloc's Tower is a short game like *Datestones of Ryn*, though it is much more complex. *Morloc's Tower* is different from *Apshai* and *Ryn* in that it is actually a puzzle. Solving it leads to Morloc himself, and the last piece of the puzzle is how to slay Morloc (difficult, since he's a wizard). The tower is six stories high, with a total of 30 rooms to explore. The structure of the tower remains constant, so it can be mapped exactly. Mapping it is important to locating Morloc. Most of the magical treasure your character encounters has certain functions that help him in the quest; he needs these functions to succeed. You must deduce their functions from hints in the story and throughout the game, and your character must use these items properly. The appearance of monsters and traps and secret doors is inconsistent, so your character must be constantly on his guard. (Actually, the inconsistency can be frustrating.) When your character does find Morloc, the wizard might just vanish.

What is Learned

Solving the puzzle of *Morloc's Tower* requires that the players search out hints, and use logic to deduce how the pieces of the puzzle fit together. To succeed the player must develop a good short-term memory to hold a large number of details, and must be focused in his attention. It helps, too, if the player actively uses visual imagination to envision how the tower is constructed and how the magical items would function. One more benefit of the game is that a player learns to think analytically in order to solve the problem the puzzle presents.

Rescue at Rigel

Rescue at Rigel is also a fairly short adventure (like *Datestones of Ryn* and *Morloc's Tower*), but it is different from all three of the games described so far in that it is set in the space age rather than in antiquity. The game is based on science fiction instead of legend or myth. Magic is replaced by technology; sword and shield are now blaster, powergun and force fields.

In *Rescue at Rigel*, ten research scientists are being held captive by the alien race, the Tollah, on an asteroid base which orbits the planet Rigel. The captives are treated like laboratory subjects, inspected and probed, at the will of the Tollah. The character in this adventure must search through the 60-room complex to find the prisoners; each is held captive in a different room. He must rescue the ten scientists by transporting them back to the spaceship, then get himself out of the Tollah base alive.

The Tollah base is a six-floor complex with connected rooms and graveshafts, liftshafts and teleports to take a venturer to and from different levels. The use of these doors is difficult and unpredictable, but can be at least partially fathomed after several attempts at playing *Rescue at Rigel*. The character adventuring through the Tollah base encounters many Tollahans and other creatures and must somehow zap them while still searching for human captives. Once your character finds a prisoner, he must transport the prisoner safely back to the spaceship, then continue searching for other prisoners. Your character has a limited time within which to complete his mission. In this game, too, the character's fatigue level must be constantly monitored; however, if he is wounded, he can heal himself with the medikit. One more space age piece of technology the character can use is the Amble System—a way of accelerating his movements and attacks (at a higher fatigue cost, of course). *Rescue at Rigel* also has three levels of play. The differences among levels are in the amount of energy in your powerpak, the number of medikits available, and the number of blaster charges you have.

What is Learned

In *Rescue at Rigel*, there is some content that may be valuable to learn, but not much. In fact, of the four games described in this chapter, *Rigel* is the least educationally valuable. The player becomes familiar with some space age terminology and a little science. More importantly, the player gains practice in trying to achieve a specific goal while having to work with limited resources. The amount of energy available for the power-gun and blaster is limited, as is the character's fatigue level. There is some strategic thinking involved, in that the player has to know when to use which type of weapon, and when to use his personal force field as a shield, and when to use the Amble System. In *Rigel*, the environment can also be mapped, although it is more difficult to do since the shafts and teleports move the character unpredictably among levels. Also, it doesn't seem pertinent to the goal of the game to map the base.

Discussion

The benefit of these games lies in the *experience* of playing them, rather than in the content. The player's imagination is stimulated by the legend or story and, to some extent, by the simple graphics. Because the graphics are so simple, players use their imaginations to visualize what the characters, monsters, and environments might look like. Kids often identify with their character. They say things like, "I'm going to check out that se-

cret door,” or “The giant mosquito got me!” A player must use strategic thinking to conserve his limited resources, and to achieve the goals of the game. A good short-term memory is required to hold all the details and rules about objects, monsters, and the environment. Map-making activities, either mental or on paper, are also possible, though it is not always pertinent to success. The player must be quick in making or defending an attack, but it is more important to make the right move rather than the fastest move. Lastly, there are problem-solving elements in the games, particularly in *Morloc's Tower*, which really is a puzzle.

Drawbacks

There are two major drawbacks to the unstructured adventure games described here: the graphics are too plain, and the role-playing aspect is too minimized. The graphics amount to little more than stick figures for the characters and monsters, with a simple rectangle representing the rooms.



In playing the game you *become* the character.

While it is true that there are some limitations to computer graphics ability, the computers that house these games (Atari, Inc. and Apple Computer Inc.) are capable of better graphics. It is unfortunate that the graphics are so bare because what you see on the screen flavors your attitude about the game. The game would be richer if the rooms had more texture and were in a variety of shapes, and if the characters showed more personality and animation. (Some newer versions with better graphics are coming out.)

The richest aspect of traditional, fantasy role-playing board games is playing the *role* of your character. You create a character, or bring one that you previously created, and in playing the game, *become* that character. If your character's dexterity is low, for example, then he is clumsy and may stumble about in the adventure. Or, if his intuition is high, he may perceive traps and magic items more readily. In board games, the attributes of your character make a major difference in how well you fare in the games. This aspect is severely restricted in computer versions. The computer determines how the character fares, and his attributes are not very important.

Even with these shortcomings, those who play these unstructured adventure games enjoy them and play them a long while, which is a significant consideration for parents when purchasing *any* recreational game, activity or sporting equipment.

9 More Adventuring at Home

by Tracy Deliman,
Jim Conlan
and
Karl Albrecht*

In an adventure game, you are the adventurer. You travel through a fantasy environment looking for magical objects, avoiding or repelling beasts, and finding treasure. In the structured kind of adventure game, the environment, objects and creatures of the game are fixed. In the unstructured adventure game, the outcome of the game can vary. This chapter describes the structured kind, while the previous chapter dealt with the unstructured type. We are examining the learning potential and educational value of the structured adventure game.

STRUCTURED ADVENTURES

In the structured adventure game, you travel through a fantasy world unfolding a sort of story that has a predetermined outcome. You choose the direction in which to move and other actions by putting together clues as you travel through the adventure. The ultimate goal is to collect all the treasure along the way and get completely through the adventure alive, with the treasure.

Several adventure games are presently available for your ATARI Computer. The best known are those created by Scott Adams for the Ad-

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venture International Corporation. There are 12 Adams adventures and an adventure sampler. The games are

- 0) *Adventure Sampler*
- 1) *Adventureland*
- 2) *Pirate's Adventure*
- 3) *Mission Impossible*
- 4) *Voodoo Castle*
- 5) *The Count*
- 6) *Strange Odyssey*
- 7) *Mystery Funhouse*
- 8) *Pyramid of Doom*
- 9) *Ghost Town*
- 10) *Savage Island, Part I*
- 11) *Savage Island, Part II*
- 12) *Golden Voyage*

We will consider two of these games here, after describing some general characteristics.

CHARACTERISTICS OF AN ADAMS ADVENTURE

Each game has a different story line and fantasy environment, but all of the games have several characteristics in common.

- 1) The adventure has a story with a fixed outcome.
- 2) You make decisions to act and travel in a fantasy environment.
- 3) You encounter beasts and other characters that you must scare off, avoid, or lure away.
- 4) You encounter many objects, magic or ordinary, that you can use in the adventure.
- 5) You must collect all of a given number of treasures.
- 6) You must get through the adventure alive, with the treasure, to complete the game.

The Adams adventures are intended for one player, age 12 and up, though kids often share the playing. The games are written entirely in text on the computer screen. The newest versions have graphics. Game 1, *Adventureland*[™], is the easiest to play. Succeeding games in the series are progressively more difficult. Later games in the series have more complex situations, a greater number of objects to manage, and require more strategic and divergent thinking in order to succeed.

At the beginning of each adventure, a set of simple instructions gives you the general rules of the game. At any time during the game, you can QUIT playing, SAVE the game, ask for your SCORE of acquired treasure, TAKE items in the environment, and INVENTORY your possessions. You can ask for HELP if you get stuck. The HELP command gives you additional clues or instructions. As the adventure begins, you are in a fantasy environment, described on the screen. You are told what items are visible and which directions you can choose to move ahead. Then you must tell the computer what to do.

Adventureland

When you load the first game of the Adams' series, *Adventureland*, you see the following message. Pay attention, these comments are the only directions you get.

This program will allow you to have an ADVENTURE without ever leaving your armchair! You'll find yourself in a strange new world. You'll be able to examine, get and otherwise manipulate the objects you find there. You'll also be able to travel from location to location!

I'll be your puppet in this ADVENTURE. You command me with 2 word, ENGLISH sentences. I do have over a 120 word vocabulary, so if a word doesn't work, try another.

Some words I usually know are: HELP, QUIT, SCORE, INVENTORY, SAVE GAME. Now hit return.

When you press the RETURN key, you see this:

I'm in a forest. Visible items:

Trees

Some exits are: North South East West

A voice BOOOOMS out:

Welcome to Adventure number: 1

*"ADVENTURELAND." In this Adventure, you're to find *TREASURES* and store them away. To see how well you're doing say:*

"SCORE"

Remember you can always say "HELP."

****What shall I do?*

We typed HELP and saw this:

A voice BOOOOMS out:

Try—) "LOOK, JUMP, SWIM, CLIMB, FIND, TAKE, SCORE, DROP" and any other verbs you can think of . . .

****What shall I do?*

We typed LOOK and saw this:

OK

I see nothing special.

****What shall I do?*

There are no more directions, no guaranteed results. You must make guesses and try things. It takes cleverness and initiative to succeed in this strange world.

You start the *Adventureland* game in a forest, and trees are the only visible items. If you are clever, you might climb a tree and see if that helps you figure out the right direction to head. Next, you go to a meadow and find a sleeping dragon and some objects. Among the objects you come across are a rusty axe with the word *Bunyon* inscribed on it, a flint and steel, a statue of an ox, and a ring of skeleton keys. At the top of a tree you climb is a spider web with writing that says, "Chop 'er down," meaning the tree, of course. You also find in the treetop the ring of skeleton keys—maybe you should take them with you before climbing down and chopping the tree.

In the stump of the tree you chopped down is a door, but you will need some keys to open it. Behind the door is another treasure, but you will need the flint and steel to light your way and see the treasure. The stump also contains magic bees and, naturally, honey. If you are clever, you might use the bees to frighten away the dragon, provided she does not attack you first, and get the dragon eggs. And, you can use the honey to distract the bear you will soon meet. The bear is guarding another treasure, a magic mirror. The mirror gives you clues about getting rid of the bear and about using the magic carpet you find. Also, somewhere along the way, you come to a swamp and get caught in quicksand. You must be resourceful in using the objects you are already carrying to get out alive. Maybe the magic word *Bunyon* might help somehow. If all this is not enough, watch out! You might be bitten by chiggers while you are in the swamp.



" And I thought computer games would be relaxing!"

What is Learned

Similar to the other adventures, *Adventureland* is a puzzle that requires logical thinking to solve. In many cases, the pieces of the puzzle must be solved in a certain order. For example, you must take the ring of skeleton keys *before* chopping the tree down, or you will not have access to the keys to use them later when they are needed. A player uses short-term and long-term memory to recall what the environment looks like, what objects and treasure have been collected, and what actions have been taken and are yet to be taken. In remembering the details of the environment the player gets practice in mapmaking. Some players draw maps on paper to help themselves navigate.

Young people learn rudimentary language skills in the adventure. To command the computer, you must type in a verb, then a noun, in that order: for example, "Get axe." You must spell the verbs and nouns correctly.

Pirate's Adventure

The setting for this adventure is, initially, a flat in London. The room must be examined carefully. The visible objects are a bottle of rum, a rug on the floor, some safety sneakers, and a sack of crackers. You must take these objects along, odd as they seem, and you must be clever enough to suppose that there might later be a reason to wear the sneakers. Sure enough, they later keep you from falling out a window. There is also a bookcase in this flat, which you must examine. Most of the books look ordinary, but there is one that is soaked with blood. Surely such a gruesome book must have something to do with a pirate's adventure, so you look more closely. The book contains some clues and a magic word. When you look again at the bookcase, you discover a hidden passageway. You go through the passageway and say the magic word. Suddenly everything spins around and you find yourself on a pirate's island.



"Do you think these are pirate clues?"

Once on the pirate's island, you must collect a number of things and build a ship. In a nearby grass shack, you find a wicked-looking pirate, a

treasure chest, and a parrot. The chatty parrot gives you clues about where to find things and what to do. Eventually, you find a cave with lumber and tools and you build your ship. The pirate, lured by the rum you carried from the flat in London, sails with you to Treasure Island. You find lots of treasure, but you must figure out how to get home again with all the treasure, without the pirate, and still alive.

What is Learned

Pirate's Adventure[™] requires some of the same kind of logical thinking as *Adventureland*, but it also needs a bit more creative thinking. It is tempting to bypass the crackers, for example, but if you approach the adventure playfully and with your mind in the lore of piracy, you know there must be a parrot somewhere who will appreciate those crackers (and whose cooperation and information you might win with the crackers). Also, you have to be inventive enough to think about looking behind the bookcase, even without clues for doing so, or you will never get on with the adventure.

In this adventure, as in the others as well, you're involved with storytelling. Pirate stories have long been favorites among kids (and adults, too), and this story adds modern elements (the flat in London, sneakers), and mystery (secret passageway and magic word), to the story. You must be resourceful when using the objects you have acquired and in gathering materials to build your ship.

DISCUSSION

In the Adams' adventure games, you exercise problem-solving skills. The games are "thinking games" that present puzzles of logic to be solved in the course of the adventure. You must be analytical and you can't let any detail pass. For example, when you are bitten by chiggers in the swamp of *Adventureland*, you must figure out what to do to keep from dying from the chigger bite before you complete the adventure. It helps, too, if your thinking is divergent; that is, if you are able to put things together in ways that seem unlikely, but ultimately are successful.

Playing an adventure game demands patience and persistence, or the game can become a frustrating experience. There are places where no clue seems evident to the next action, and you are going in circles without progressing in the adventure. At these points, it helps to be creative as well as patient.

There is an order and a logic to the games. You need the right tool or the right cure, at the right time, and you must know how to apply it. You

must try new command words. You must discover things by trial and error. Your spelling had better be correct. You will do a good deal of reading, and a lot of thinking. The games use a raft of high-level skills.

Lastly, there is also an element of cooperation involved. The adventure games can be played alone, but they are most fun when played with friends. Two heads generate more wild ideas faster than one head. If you do play alone, you can still share your insights and information with other players. A master player is sought after for clues, cures, command words, and other useful information. Have fun in your adventuring.

10 **The Family That Plays Together, Learns Together**

**by Pat Tubbs*
and
John Tubbs****

If you think computers are strictly for the younger generation, you are missing out on a chance to learn and grow with your kids. With all the pressures in our harried lives that keep families apart, a home computer can bring families closer. More cooperative problem-solving goes on when children and their families use computers. A computer can draw out the quiet personality, allowing the quiet child to learn at his or her own pace, in partnership with a machine that makes no judgments and has abundant patience. A sharing can take place that is frequently lacking in other situations. Children have the opportunity to compete on an equal level with other members of their family, and gain a real feeling of their own strengths and self-esteem. In short, families can experience an enthusiasm that crosses all age barriers, when playing and working with a computer.

THE USE OF COMPUTERS

Families with youngsters of all ages can benefit by becoming familiar with the computer. There are many programs written for the pre-schooler, which are still interesting and challenging enough for older children and

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** John Tubbs is husband, father, and Scientific and Engineering Associate at Stanford University. He has been involved with computers since 1966.

parents to use together. Learning beginning writing skills (Spinnaker Software's *Story Machine*), writing school reports (Broderbund Software, Inc.'s *Bank Street Writer*), or keeping track of stamp collections (*File Manager*® by Atari, Inc., family mailing addresses (APX's *Disk Mailing List*), or tax information (Synapse Software's *FileManager +*®), can all be done with your ATARI home computer. Family members might want to form teams and work together to develop strategies for better problem-solving. Or, the entire family might join together to play one of the learning games, keeping a running tally of the score (no names attached). When an agreed upon score is reached, they can all go out for ice cream or pizza.

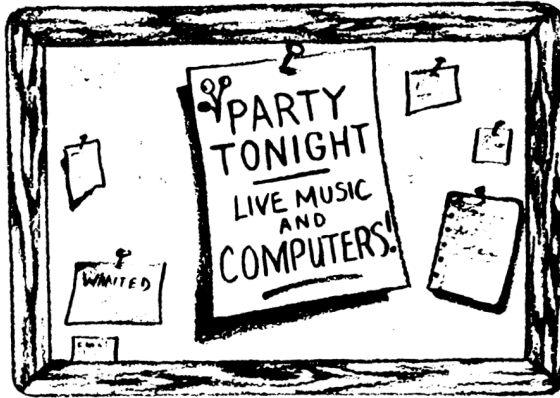
One of the favorite learning games our family has enjoyed is *European Capitals* from Atari, Inc. In this game, players must identify the European country and its capital. We were always drawn into the game whenever someone started; it became a joint effort to see just how many of the countries and capitals we could identify. There was never any competition to see who knew the most, just the fun of doing our best. It is challenging to identify some of the lesser-known European countries by their outlines on a map.

A problem-solving program we all enjoyed working on together was *The Factory*™ by Sunburst Communications. This is an animated, color graphic, sound program that shows you how to use machines to cut holes or lines in something that looks like a slab of wood. Depending on how you position the cuts and how many you request, the "product" (the design you are asked to replicate) changes. We found ourselves thoroughly enjoying this program designed for K-8 users. Even though our daughters were older, it was still challenging for all of us.

Computer games can be the focus of a good party. As our daughters grew up through their teen years, the parties at our house were always well-attended. With the computers in the living room and the stereo in the den, people kept moving from one entertainment area to the other, but the computers always had several kids around them. Whether encouraging the player or rooting for the computer to win, a group spirit was generated. This was terrific for the kids; it did not make any difference whether the boy/girl ratio was uneven because the computers were always available to those who did not care to dance.

EARLY EDUCATION

Children as young as two years of age will discover that the computer provides an entertaining way to learn. The computer can "speak" as well as



display screen graphics. Thus, all instructions as well as interesting, interactive stories, can be given verbally to a prereading child.

Programs are available to help the child learn prereading skills such as left-to-right eye movement and shape recognition. Other early development skills that can be enhanced with computer use are color recognition, shape discrimination, and directional meanings such as “above,” “below,” “left” and “right” (*Juggles’ Rainbow* and *Juggles’ House* by The Learning Company). Learning to recognize the letters of the alphabet, in upper and lower case, and the sound of each letter are also possibilities for your prereaders.

Early readers will benefit from programs that combine a voice reading a story (*Sammy the Sea Serpent*®, Product Design, Inc.) with minimal text on the screen. Many of these programs are written to keep your young child entranced—and you entertained while you work and play with your child.

It is important to work on these skills as a family. You can do this by all sitting together at the computer, or by being near enough to share in the breakthrough when your child is excited and wants to share the thrill of a new accomplishment.

Introduction to numbers, shape, and value, is another area where your home computer will be an entertaining and educational tool. A program such as APX’s *Counter*tm can teach your child to count objects up to 15 and learn the Arabic numeral as well as the word for that number. Other programs are available to help your child learn to read an analog (traditional), as well as a digital clock.

Art is an area where age or experience levels do not have to be important and programs such as the Capital Children’s Museum *Paint* (Reston Publishing Co., Inc.) bring art and the computer together. *Paint* comes with an easy to understand instruction guide and also an informative book on the

history of art up to the present. This type of program shows us we *all* are artists; most of us just have untapped talents.

Your home computer can help your family find their hidden musical talents or enhance those already apparent. There are programs to help the novice of any age learn to read musical notation (*Music 1: Terms & Notions*, from APX), make simple or complicated musical pieces, or simply sit back and enjoy music preprogrammed for you (*Advanced Music System™*).

SCHOOL AGE CHILDREN

Many programs are available that will help build reading and comprehension skills. There are game programs that family members can use together as skill-building exercises. With APX's *Wordmaker*, for example, people of all ages can participate, seeing who can come up with the most three- or four-letter words in a specified time.

There are many other similar games. On the computer these games are quick and lively. They are re-created each time by randomly choosing the presentation of the words. No matter how many times your family plays a particular game using the same set of words, there will always be a new challenge. You may put in your own words or use those in preprogrammed lists. Also, there is usually the option of playing against the computer, or with a family member or friend as your opponent.

APX's *Spelling Genie* is only one of the many spelling games that is sure to improve any family member's reading and spelling ability.

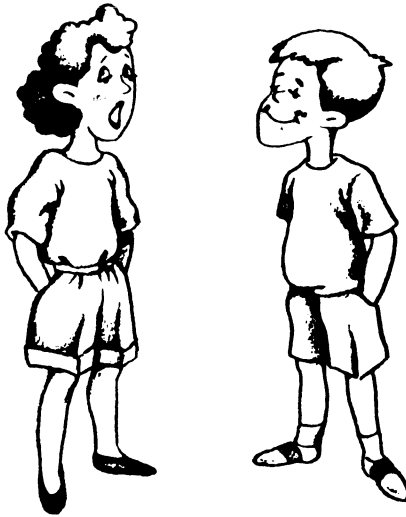
If you wish to know the reading "level" of any piece of text a member of your family is reading, programs have been developed to give you that level. You type into the computer 100 or so words from the text in question. The computer will then calculate the reading level, using one of the commonly used reading ability formulas (APX's *F.O.G. Readability Index*).

There are programs available that can help you become proficient at typing quickly and painlessly. Some of these programs are games that help you become familiar with the keyboard and the locations of the keys. Others, such as *MasterType* from Atari, give typing instructions and help you increase your skill and typing speed.

All areas of math are covered using your home computer, everything from beginning addition to calculus. Programs are available to help parents, as well as their children, learn more about the metric system. Many math games, such as *Teasers by Tobbs™* (Sunburst Communications), have many

different levels of difficulty, making it challenging for every member of the family. Estimation and measuring using a ruler or liquid measure, are also areas of math where the computer will be of assistance to everyone.

The computer is most helpful in simulating scientific experiments. Not many of us can (or would want to) take our families into a nuclear reactor to learn how it functions. Yet this can be done safely on a home computer. Many other types of experiments can be done with a simulation program, right in your living room, without requiring expensive equipment or a great deal of time.



"I had a meltdown in the reactor core last night, but it was OK. I just turned off the computer."

One simulation, *Oregon Trail* (Computer Using Educators Softswap), allow you to re-create a pioneer trip from Missouri to Oregon over the Oregon Trail in 1849. Decisions are made about spending money, hunting, and what to do about marauding Indians and other trials the early settlers faced. A more modern simulation involves being trapped on top of Mount Saint Helens (*Volcano*, C.U.E., Softswap Library). Decisions must be made to get safely back to civilization; again, your family can make all necessary decisions.

There are literally hundreds of educational, entertainment and business programs available.

CAI

CAI is an acronym frequently used in educational settings. It stands for Computer Assisted Instruction, and simply means to use the computer as an aid for instruction. As reported in the May 1983 issue of *Personal Computing*, Professor James Kulik and his colleagues at the University of Michigan found in their research on students in sixth grade and above, that not only were test scores of students using CAI higher than those students not using Computer Assisted Instruction, but that speed of learning CAI information was greater.

PUBLIC DOMAIN SOFTWARE

As with your stereo system, you might eventually spend more money on software (records) than on your computer (stereo). Thus, parents will be pleased to learn of the existence of public domain software. This is software that is available to the public, usually developed with the assistance of government funding. Public domain programs may be copied for educational purposes, but not for resale.

In California, the San Mateo County Office of Education joined with an organization known as C.U.E. (Computer Using Educators), to form a software lending library, C.U.E. Softswap. Under the direction of Ann Lathrop, C.U.E. Softswap now has over 400 programs for several computers, including ATARI—perhaps the largest collection of public domain software in the country. People can come to the library in Redwood City (appointments needed), or to any of several Teacher Education and Computer Centers in California, and copy the programs free of charge. Every program in the library has been evaluated by at least two educators before it is made available for copying, to insure its educational value. For a \$10 fee, people who live outside the area may order a disk copied. For more information, see the Appendix.

HOW TO CHOOSE A PROGRAM FOR YOUR FAMILY

One of the things we look for in a program is “user friendliness.” This means, does it have clear, easy-to-follow instructions? Are there instructions in the program, as well as in the printed documentation? Can the instructions be skipped if they are embedded in the program? Is there a “help” option that will allow you to re-read the instructions if you need to? If you

know how to use the program, you will appreciate skipping the instruction portion and only returning for help as needed.

If the program is intended for a young child's use, are the instructions on a reading level that can be easily understood by the intended user? No matter how interesting or creative the game, the youngster first has to understand how to play it.

Is the program protected from incorrect usage by an inexperienced user? If you inadvertently—or purposefully—push the wrong key does the program continue? If the wrong key is pressed the program should allow you then to press the correct key without stopping.

GAMES FOR COOPERATION AND GROWTH

The following is an article written by Peter J. Favaro and first published in *SoftSide Magazine* (December 1982, Issue #35). Although the author was speaking to game designers, we believe parents interested in putting a school in their homes will find it interesting, and perhaps will want to consider some of his ideas when they seek out software.

The authors of *Buy a School for Your Home* want to add that Mr. Favaro's contention that there is not yet enough evidence to claim certain games increase eye-hand coordination, may be true. However, we have watched hundreds of children playing arcade and home computer games. It appears to us that after time spent playing these games, the eye-hand coordination of almost all children shows a marked improvement. Not conclusive, but definitely consistent.

GAMES FOR COOPERATION AND GROWTH **by Peter J. Favaro**

This year, parents will spend millions of dollars so their children can happily blast away aliens, munch on goblins, conquer planets and otherwise defend themselves and others in video game fantasyland. As one advertisement dramatically puts it, "The battle for the galaxy has reached the homefront. . ." Some of these parents will plop down 25 to 50 of their hard-earned dollars on game cartridges or computer software with hopes of rolling up their sleeves, grabbing their favorite joysticks and sharing in the vicarious thrills that delight their children. Others, however, will spend their money with ambivalence and concern, yielding not to a vociferous and perhaps overzealous group of concerned parents and social scientists who have

staunchly criticized video game play, but to the whines and howls of their children, who want what “everyone else has.”

The video game controversy began in 1981, long after the arrival of the first coin-operated arcade game, *Pong*. A group of angry parents and community leaders in Mesquite, Texas sought, and subsequently succeeded, to ban video game arcades because of their supposed disruptive influence on the behavior of the town children. Other towns and even whole countries (the Philippines and Singapore) followed suit, claiming that the games cause aggression, truancy, “psychological addictions” akin to gambling, and encourage stealing money from parents and others to support children’s video game habits. The concerns spread from the arcade games to the home games. Social scientists, i.e. psychologists, psychiatrists and anyone else who had an opinion, jumped on the video game bandwagon and engaged in heated debates on talk shows across the nation, over the relative consequences and/or benefits of video game play. Most of the debates seem like outlandish parodies of the notions we hold about people in the mental health professions, with the most bizarre comments alluding to the fact that many of the games serve as substitutes for “adolescent masturbatory activity.” To date, none of these self-proclaimed experts have presented even a shred of replicable scientific evidence to support their speculations. The media eats all of this up, of course, hyping the controversy which today is as strong, if not stronger than ever.

I am a school psychologist, a doctoral candidate in clinical psychology, and an educational computing consultant. I began doing video game research in 1980, long before it was fashionable for social scientists to be concerned about such things. My doctoral dissertation is a major research effort designed to test whether video games cause changes (either positive or negative) in either mood or ability to do certain tasks which require concentration, memory, etc. It will also observe whether the games cause increases in physiological arousal (as measured by heart rate and blood pressure) that may be potentially dangerous, as some have suggested. After three years of work, I refer to the studies I have completed as “exploratory investigations,” choosing to save my opinions and speculations for discussions over wine and cheese. The reason for this is that in science, things like this must be proved over and over again for them to be accepted phenomena. Even the so-called hard sciences, like physics, rely on replicability to prove theories so that there can be certainty that the results are not due to chance factors. The point I will make here, and stress throughout this article, is that much research must be done before anyone can say something definitive—good or bad—about video game play.

I will briefly present both sides of the existing video game controversy and the shortcomings of both the pro and con side of the debate. I will discuss some of the work I have done and then present an alternative philosophy to video game design. I will definitely not resolve the issue of whether the current video games are harmful or not, as this remains to be seen.

The alternative design philosophy presented here is called GCG design and philosophy, *Games for Cooperation and Growth*.

Video Game Criticisms

People who oppose video game play generally do so on two grounds: (1) that they are addictive, and (2) that they cause inappropriate social behavior. Aside from the fact that there is no evidence to support either of these comments, from a technical point of view, they are both illogical and incorrect. Technically, no behavior can be addictive, because the word “addiction” technically describes a physical dependence on an ingested substance. In general, the words “addiction” and “addictive” are confusing and vague—they are not even used in the current clinical diagnostic criteria for mental disorders.

The real concern should be whether or not the games can become targets for compulsive behavior (behavior which is unstoppable because of an uncontrollable urge to perform it). The answer to this question is “yes,” and the reason has nothing to do with the games themselves. Individuals who develop compulsions will always find a target for their habits. Food is frequently a target for certain compulsive people, as are work and many other behaviors. In view of this, however, we do not seek to close down supermarkets, ban cakes and chocolate bars. This would be an absurd thing to do. Not everyone who eats chocolate bars and ice cream does so to the extent that it makes them dangerously obese. Some children, I believe, may be honestly obsessed with *Pac-Man*, and may have a compulsive need to play the game. These children, however, were bound to have had emotional problems before the game was ever invented. The bottom line is that each parent bears the responsibilities of regulating and directing his child’s behavior. This includes all kinds of recreational activity, not just video game play.

That the games cause aggression in children also remains to be seen. Parallels have been drawn which compare video game play to watching television. It has been well-known that watching violence on television may increase violent behavior in children, so people believe that because some video games have aggressive themes, the same is true. This may or may not

be so. A major distinction between video game play and television watching is that TV watching is a passive activity, while video game play is an active activity. What difference does that make? Maybe none. Hopefully, my doctoral research, which compares people who play video games to people who watch television, will give us a clue. In the meantime, I would like to mention that a fundamental principal of psychotherapy with children assumes that aggression, acted out in socially appropriate ways during play, is helpful in teaching children to deal with their aggression and conflicts. Again, we must wait until the research is in to prove such a notion.

I would like to make one general observation regarding children's play activities. Violence and aggression have been major themes in child's play for decades. Think for a moment about the themes, behaviors and roles involved in childhood games such as Cowboys and Indians, Cops and Robbers, even Tag and Hide and Go Seek, all of which involve either stalking, catching, shooting, killing or fighting.

Pro Video Game Arguments

Supporters of video game play have made similar outlandish assumptions. Many have claimed that the games increase eye-hand coordination. This is simply not true, and won't be until there is a good deal of evidence to support it. The first research I conducted on video game play studied whether video game play increased eye-hand coordination in children. The results were not significant. This does not mean that they *couldn't* increase eye-hand coordination if I used them in a different way than the way I used them. It just means that in the population I studied, I failed to find this effect. One possible reason for this is that, in order to show that transfer from one task to another exists, the task you train people to do must be similar to the task in which you hope to see the transfer occur. Here is an example.

Let's say I am going to develop a sports training experiment. I want to train two groups to play different sports activities and then see which group transfers best to the criterion I have set up—racquetball skills. I will train group A at basketball, and group B at tennis. Which group would you predict does better at the criterion task? Group B, of course, because tennis involves skills which are similar to racquetball. Now, could I then say tennis training improves "sports skills?" Not really, because the generalization would be too broad. There are many sports which tennis training would not improve. The point here is that "eye-hand coordination" is very complex, and that the criteria which we use to measure eye-hand coordination may not involve the same kinds of skills needed to play video games.

GCG—An Alternative

Besides attacking the logic used by my colleagues to either bolster or banish video game play, I have not done much in the way of constructive criticism. This is a bad habit which most scientists learn very early in their careers. Let me mend my ways by offering an alternative video game design philosophy called *Games for Cooperation and Growth* (GCG). GCG design philosophy was spawned by my recent experiences with 30 learning-disabled and emotionally-disturbed children with whom I worked as a school psychologist. My task was to teach these children appropriate social behavior—concepts such as sharing, helping, good sportsmanship, etc. I achieved my goals using video games, specifically the ATARI VCS and several of the cartridges. I did not let the children play in the usual way. I modified both the games tasks and the surroundings. For instance, two players would play *Asteroids*, but not one against the other. One player would fly the ship, while the other player pushed the trigger to shoot the missiles. The children played in pairs for a cumulative score. When all the children reached a grand total of one million points, we had a party. We were all one big team focused on a goal which stressed mutual support, cooperation and social reinforcement. No child was allowed to compare his score to another child's or make a discouraging comment. Players could only offer positive support to one another. In just a short period of time, these children showed remarkable and demonstrable gains in all aspects of their social behavior. Children who were not used to expressing any other emotion but anger were patting each other on the back and offering one another praise.

Soon after I finished my work with these children, I began experimenting with the ATARI 800, creating games using the experiences I gained from my work with them. The game design philosophy outlined here is intended to aid programmers in developing games which facilitate positive social contact between the players. The GCG design philosophy suggests modification of current game tasks, roles, themes and values.

Setting the game goal. The goal of any game is the very reason why players play it. Common game goals include scoring points, having fun, winning the treasure, or saving a planet. Game designers should structure the goals of the games with partnership and cooperation in mind. Make the goal impossible to achieve without a high level of cooperation. Failures should occur when one player tries to overstep his boundaries or show off.

Structuring the game theme. Life is valuable, even in video games, and not enough has been done to teach this concept. Games should be constructed so that the game theme of “killing the bad guys” becomes “cap-

turing the bad guys.” Focus on rescue missions, good-will missions and intergalactic peace-making. Packaging and advertising art should be carefully planned. One of the most astonishing things about video games, and one which has definitely contributed to their bad image, is that while the actual graphics themselves are often stick-like schematic representations, the packaging is filled with scenes of graphic violence.

Alternate the game tasks. Video games typically focus on only one kind of skill—shooting the invaders, completing the maze, etc. Difficulty is increased by increasing the number of targets, the speed of the targets, or both. Game tasks can be made more variable, so that the player who is poor at shooting the invaders might excel in something else, such as landing the space pod. In other words, create games that have multiple tasks with different situations or frames requiring different skills. Split up a task so that two players have to develop “togetherness” to do it well, something akin to what must be done in a three-legged race. Let STICK (0) control the horizontal movement of player 1 and STICK (1) control the vertical movement of player 1.

Alternate and equalize the roles of the players. Let both members of the team be co-captains with equal responsibilities. When the game theme calls for roles with unequal power, vary the situation or environment so that player 1’s role characteristics are more powerful in situation one, but player 2’s characteristics are more powerful in situation two. Make the players *dependent* on each other.

Emphasize higher-level thinking tasks. Stress problem-solving and strategy planning. Create pauses in the game so that players can confer and plan their strategy together. Allow several means to achieve the same goal.

Let the computer be a model. Program the computer to demonstrate the appropriate social reinforcements, such as printed statements like “nice work.” Always make the compliments team-oriented. Have the computer direct cooperation by signalling the need for conferences or strategy planning sessions. If the score of the game reflects the level of cooperation of the players, you could have the computer print a message when the score drops below a preset level.

Using GCG design philosophy in video games does not require any drastic change in programming techniques. As a matter of fact, any intermediate-level programmer with a sensitivity for cooperation and togetherness could easily develop these games.

Part II

Reviews

In the 1950s, when television was first becoming a popular fixture in American homes, viewers avidly sat glued to their seven-inch screens, watching anything from *Howdy Doody* to wrestling. In time you (or your parents) became a little more sophisticated, and the quality of television programs improved. Today “junk food” programs still abound, but you can also choose to view *Masterpiece Theater*, *Cosmos*, *Hill Street Blues*, college-level instruction programs, and numerous programs with a high level of cultural or entertainment value.

Today’s software for home computers is probably pretty close to the level of early television programs. There is a lot of software available, but the majority of it will not stand the test of time. There is not even general agreement on what makes a good program.

When we wrote *Buy a School for Your Home*, we were fortunate to have the opportunity to review well over 100 pieces of educational and recreational software. Furthermore, we had the assistance of hundreds of parents, teachers, and the kids for whom the software was intended, to tell us what they thought of these games and programs.

This section contains the results of these reviews. Testing was set up to see if parents and teachers found the programs educational, as well as enjoyable; the kids let us know if they were fun. The majority of evaluations were enthusiastic, since most playtesters really enjoyed the games and programs. Therefore, the majority of reviews are favorable.

We decided to go one step further, so you will also see the *Buy a School for Your Home* authors' "*Hall of Fame*" programs. These are games that both appealed to the playtesters, and met our criteria for programs that deserve to be in a school in your home. (In case you are wondering, we looked at ease of instruction, game content and technical quality. Some of the things we asked were: did the program allow the player to teach himself or herself; was it tolerant of mistakes; was there variety and different levels of play; was it artistically pleasing; did it give appropriate feedback; could the learning be carried over to other areas; and was there a high degree of interaction, rather than merely passive instruction? On top of that we tried to decide if the program had that elusive quality we called "FUN," which would hook the user into playing it again and again.)

There are a few programs that appealed to our playtesters and were given a WOW! rating, but are not *Hall of Fame* programs. This in no way takes away from the programs' merits; they just did not happen to meet our criteria.

In a very short time, software will offer much more in the way of content, graphics and user-challenge. The home computer field is still in its infancy, but we believe it will not be long before software begins to meet its exciting potential.

THINGS MOTHER NEVER TOLD YOU

Most of our adult playtesters were new to computers. They volunteered to assist us both to help their children or students, and as a way to learn more about these newfangled machines themselves.

What these newcomers taught us was that there are three or four points software publishers often fail to mention—things people without prior computer experience would have no way of knowing. Since these items of information were so commonly lacking in documentation, we decided to list them here, rather than repeating them again and again in the reviews.

- 1) A BASIC cartridge is often required. Programs are written in different computer "languages." The computer recognizes, and will take directions, in many forms—or languages. If a program happens to be written in something called BASIC (and perhaps half these programs are) then a BASIC cartridge is needed before the program will run. These cartridges usually come with the ATARI Computer.

Be sure the cartridge is in the machine before you begin loading the program.

- 2) While cassette tapes are less expensive than disks, they take a long time to load. In a few cases where programs would take longer than ten minutes, we lost some testers! Several adults became impatient and decided they would not bother. Kids, on the other hand, were not quite as upset by the wait. But the waiting time might be a consideration when you want to buy a program. Computers have infinite patience, computer-users don't.
- 3) To start a cassette tape program you usually need to type in "RUN."
- 4) After a program begins running, it often asks questions. In many cases, after keying in your answer you will need to press the RETURN key. This lets the machine know you have completed your response.

Here are the reviews. We suggest you examine them with your children. We wish you all fun in deciding what you and your family will put in a school in your home!

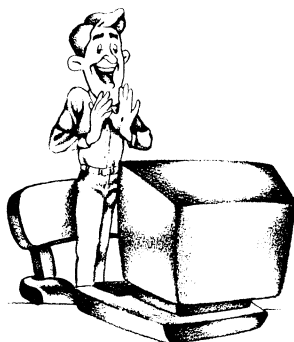
The following is the legend used to rate programs in the review section.

LEGEND

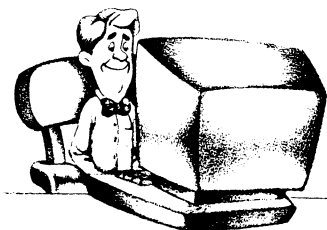
Wow!



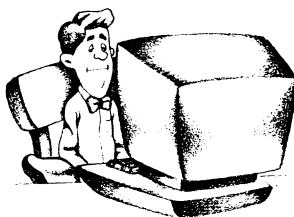
Good



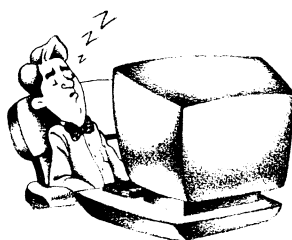
Average



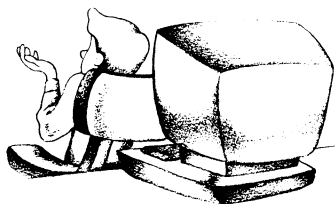
Poor



The Pits

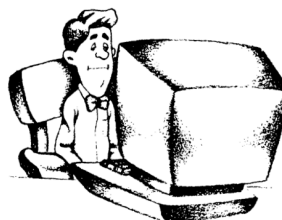


Unknown



Adventure #1 Pirate Adventure Saga #2

by Adventure International



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

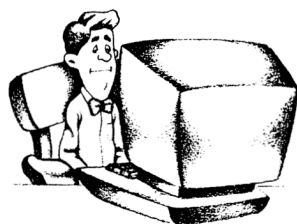
	Kids	Adults
Instructions	C	D
Content	C	D
Technical Quality	C	C

Comments:

Both these games were discussed in great detail in Chapter 9. The original versions were text only. We were able to review the later versions which had graphics added. Although a couple of old line, adventure-playing purists insist they prefer the all-text mode, most of the kids agreed that the graphics are a real plus.

The Adventures of Oswald

by Program Design, Inc.
(PDI)



Grade Level and Type

Recreational <input checked="" type="checkbox"/>	Preschool <input checked="" type="checkbox"/>
Educational <input type="checkbox"/>	Elementary <input type="checkbox"/>

Requirements

Disk <input checked="" type="checkbox"/> 24K	Cassette <input checked="" type="checkbox"/> 16K	Cartridge <input type="checkbox"/>
BASIC Cartridge <input checked="" type="checkbox"/>	Joystick <input checked="" type="checkbox"/>	Paddle <input type="checkbox"/>

How They Rated It

	Kids	Adults
Instructions	A	D
Content	A	D
Technical Quality	B	D

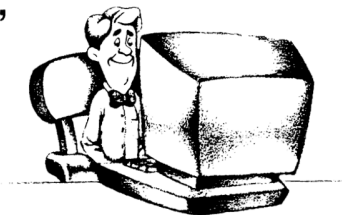
Comments:

The Adventures of Oswald is an "interactive story." Children playing the program can help the little boy named Oswald climb, jump, etc., by making appropriate moves with their joysticks.

Parents and teachers thought *Adventures of Oswald* would be more appropriate for preschool through kindergarten level. The youngest of our testers enjoyed it, but the sophisticated six- and seven-year-olds felt it was too slow-moving and didn't want to finish the story. As is the case with most cassette tapes, players of all ages became impatient with the length of time it takes to load the program.

Alien Garden

by Automated Simulation,
Inc. (EPYX)



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☐ Cassette ☐ Cartridge ☒
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	B
Technical Quality	B	C

Comments:

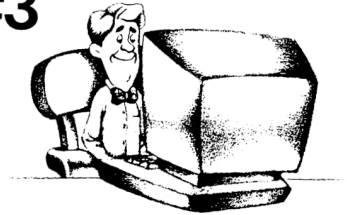
Luther Burbank would never recognize this garden! In this game the player controls a flying insect that stings or eats flowers. However, the flowers regenerate, and with each reincarnation they acquire different properties. The directions to *Alien Garden* must be read before the game can be played.

Shape and pattern recognition, and memory, count for more than quick reflexes. There are a few glitches and frustrations, but overall *Alien Garden* has much to recommend it.

An Invitation to Programming #2

An Invitation to Programming #3

by Atari, Inc.



Grade Level and Type

Recreational ☐ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☐ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	A-
Technical Quality	C	C

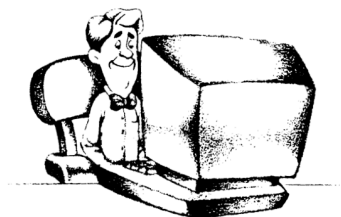
Comments:

Although the majority of children (and adults) are content to just play the games, a sizeable number want to go beyond that and learn to make their own games. They want to learn how to program. These two programs give a good start. The packages contain cassettes and workbooks. *An Invitation to Programming #2* explains slowly and completely, in very readable form, the basics of programming. *Number 3* is an invitation to sound and graphics.

While the information contained in *An Invitation to Programming #2*, and *#3* is excellent, using the cassette medium to learn programming can be difficult at times. Those who wish to learn programming in BASIC, might also consider some of the books listed in the Appendix.

Asteroids

by Atari, Inc.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☐ Cassette ☐ Cartridge ☒
BASIC Cartridge ☐ Joystick ☒ Paddle ☒

How They Rated It

	Kids	Adults
Instructions	C	A
Content	B	B
Technical Quality	B	A-

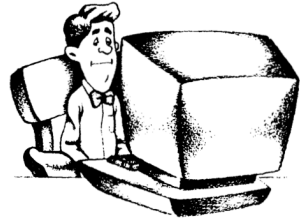
Comments:

Asteroids is discussed in great detail in Chapter 7. The game, played with one to four players, involves navigating a spaceship through a perilous asteroid field. As you might expect, you must try to destroy the asteroids before they destroy you.

Our playtesters at elementary levels were captivated with *Asteroids*. One young man, who appeared knowledgeable about such things, told us that because there was more variety, the home version was superior to the arcade game. Adults seemed to consider the game a guilty pleasure—they were apologetic about enjoying it so much.

Astrology

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	D	C
Content	D	B
Technical Quality	C	C

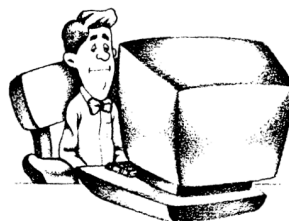
Comments:

What is your sign? Your ascendant? Where was the moon when you were born? Is your horoscope compatible with your spouse's? Your children's?

Whether the study of astrology is valid is not the issue. (The authors have had some interesting discussion about it.) But APX's *Astrology* seems to be a fascinating program for all our testers. The program does not go into depth in analyzing a horoscope, but it does calculate a person's horoscope in seconds. While the adults seemed more interested than the children, even the young man who was most bored with the program declared he really enjoyed learning about time zones.

Attank!

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒ 32K

Cassette ☒ 24K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	D
Technical Quality	C	D

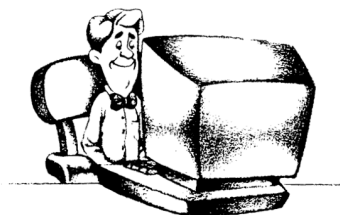
Comments:

We classified this arcade-type game as entertainment. With some stretching, it could be considered educational also, since the game requires more strategy than other games of this type.

Players control two tanks on a battlefield. The biggest problem with this game is the graphics. To adults, they are blocky and unconvincing. However, with the enviable imagination of kids, our young playtesters found it exciting and fun.

Avalanche

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☐

Joystick ☐

Paddle ☒

How They Rated It

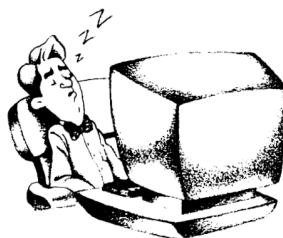
	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	C	C

Comments:

An avalanche of rocks is poised overhead, ready to pummel you. What to do? If you play this game long enough, you may build up enough speed and dexterity to survive. On the other hand, most of our adult testers did not feel they would be interested enough in *Avalanche* to play that long.

Babel

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

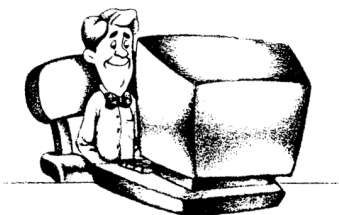
	Kids	Adults
Instructions	F	A
Content	F	D
Technical Quality	F	C

Comments:

Babel is a two-player game, each player racing to construct a pyramid-like tower in order to reach and touch the overhead stars. There are three levels of difficulty. *Babel* was a little tricky for our playtesters to master, but there are numerous diversions that add to the interest level. Players risk falling when they ascend the tower, getting trapped in their own tower by boxing themselves in with bricks, the "wrath of heaven" (novices are spared this), and randomly occurring celestial events.

Basketball

by Atari, Inc.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☐ Cassette ☐ Cartridge ☒
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	B
Technical Quality	A	C

Comments:

At first, one reviewer wondered why kids would bother with *Basketball* on the computer when it would be more fun for them to play basketball in the gym or on the driveway. However, parents enjoy watching televised versions of the sport. This cartridge game is somewhere in between active playing and passive viewing.

The graphics are very well done, and when more than one child is playing (up to four can play), there is plenty of excitement. Players can compete against one another or against the computer. Jim, a sixth grader, liked blocking his opponent's shots. Ryan (9) and Brandon (10) thought the player spinning the ball on his finger was "awesome." Girls and boys equally enjoyed *Basketball*.

Big Math Attack

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	A
Content	B	A
Technical Quality	B	A

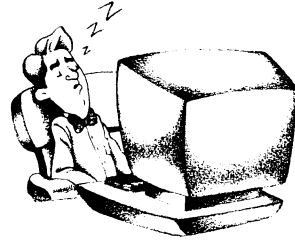
Comments:

It is not always possible to get kids to brush their teeth after every meal, wash behind their ears, or stay away from puddles on rainy days. However, now there is a computer game that will get kids to drill and practice arithmetic until they are math whizzes. *Big Math Attack* is addictive in the most positive way.

The object of the game is to correctly answer an "equation bomb" dropped by a rocket ship on the city below. If the correct answer is given, the bomb is destroyed and points are gained. If an incorrect answer is given, the equation bomb will land and the correct answer will be displayed for several seconds for the player to study. *Big Math Attack* was requested over and over by the kids. When one or two would play a cheering section (also learning) would gather. The only criticism the kids had was that the first answer has to be accurate—you cannot change a typing mistake.

Block Buster

by APX



Grade Level and Type

Recreational <input checked="" type="checkbox"/>	Preschool <input type="checkbox"/>
Educational <input checked="" type="checkbox"/>	Elementary <input checked="" type="checkbox"/>

Requirements

Disk <input checked="" type="checkbox"/>	Cassette <input checked="" type="checkbox"/>	Cartridge <input type="checkbox"/>
BASIC Cartridge <input type="checkbox"/>	Joystick <input type="checkbox"/>	Paddle <input checked="" type="checkbox"/>

How They Rated It

	Kids	Adults
Instructions	F	C
Content	F	C
Technical Quality	F	B

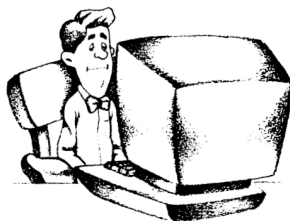
Comments:

Block Buster is a cube puzzle and problem solver. It can help solve the mystery of the Rubik's Cube by allowing the player to view all sides of the cube at once, program sequences of moves that can be invoked with a single command, and instantly reset the cube. Moves can also be timed and counted. The game is suggested for one player, age nine and older.

The graphics are well done, and could possibly aid in spacial perception. *Block Buster* has merit, but was a bit too difficult, and thus frustrating, for our nine- and ten-year-old playtesters. We would recommend it for junior high and older.

Block'Em

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

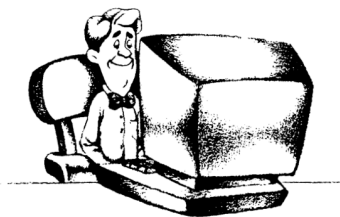
	Kids	Adults
Instructions	A	C
Content	A	D
Technical Quality	C	C

Comments:

Designed for two players, *Block'Em* is a competitive game where one player tries to force the other to collide into a moving wall. Players decide ahead of time the winning score (1 to 99 points), size of the wall blocks, and one of six speeds.

Caverns of Mars

by Atari, Inc.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	B	C
Content	A	C
Technical Quality	A	C

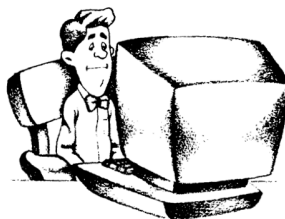
Comments:

If you and your children enjoyed the *Star Wars* saga, you will like *Caverns of Mars*. This is an arcade-style game with some substance to it. Players attempt to sabotage the Martian defense system (Mars has declared war on "Terra IV") by activating the deadly fusion bomb in Martian Headquarters—and then escape. The players must navigate five levels, each with different obstacles.

Young players might be interested to know *Caverns of Mars* was created by a seventeen-year-old southern Californian boy, who has been building his own electronic equipment since he was eight!

Compu-Math: Decimals Compu-Math: Fractions

by Edu-Ware Services, Inc.



Grade Level and Type

Recreational ☐

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒ 48K

Cassette ☒ 32K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	D
Content	A	C
Technical Quality	C	C

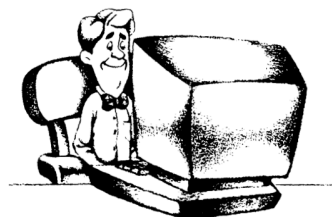
Comments:

The *Compu-Math* programs are the Fords and Chevys of the software programs we reviewed. Not sporty or flashy, they are sturdy, reliable and get the job done. This is drill and practice stuff, very thorough and comprehensive. No showy graphics or giddy sound effects here, but if your child needs to learn, re-learn, or drill on the basics, these programs can fill the bill.

Biggest drawbacks: you can't change the mode you are in, correct a typing error or ask for help.

Compu-Read 3.0

by Edu-Ware Services, Inc.



Grade Level and Type

Recreational ☐ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 48K Cassette ☒ 32K Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	B	C

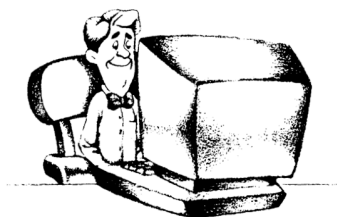
Comments:

Compu-Read 3.0 is an integrated system designed for the improvement of reading skills. It is set up to be used by very young readers up to adults, wishing to improve speed and recall of printed materials. Areas covered are: letters, words, synonyms and antonyms, and sentences. A user may also build his or her own files for practice. Overall, the program is quite serviceable in aiding one's reading ability. It works very well, and the documentation gives additional information in learning.

Criticisms from the testers follow: The computer is too slow in accepting typing. Therefore, many correct, speedy answers were called wrong. The user is unable to correct a typing error. Written instructions tend to be dry and tedious. (The authors believe not everything should be flashy, but it doesn't have to be dull, either.)

Con*Putation/ Tonal Encounter

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	B	C

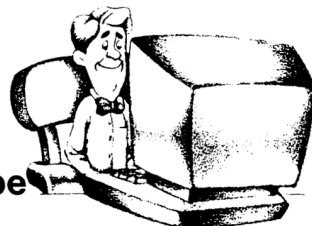
Comments:

Remember the old TV show, *Concentration*? Well, this is it—minus the rebus puzzles and Jack Narz. In *Con*putation*, 20 boxes appear on the screen and you must match the math puzzles behind them. Adults were most critical of the written instructions, but the kids just enjoyed playing.

These are two memory-building programs on the same cassette/disk. If *Con*putation* is reminiscent of *Concentration*, *Tonal Encounter* is similar to *Simon*, one of the first popular electronic games for kids. Here the user is asked to play back the melody that the computer composes. There are five levels of play. (SEE *Memory Match*)

Conversational French **Conversational Spanish** **Conversational Italian** **Conversational German**

by Atari, Inc.



Grade Level and Type

Recreational ☒ Preschool ☐
 Educational ☒ Elementary ☒

Requirements

Disk ☐ Cassette ☒ Cartridge ☐
 BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	B	B
Technical Quality	B	C

Comments:

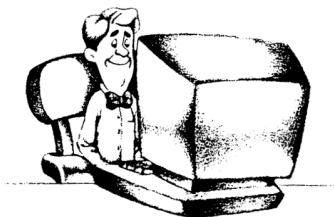
Atari has published a series of language tapes. Our reviewers only had an opportunity to evaluate the French and Spanish versions, but we understand Italian and German follow the identical model. The language taught is the everyday language of the country.

To attempt to learn more than some interesting, fun, conversational words and phrases would involve a large commitment of time, but reviewers were quite impressed with these programs. Some even decided they would put in more time after the review sessions ended.

The usual classroom method of learning a foreign language involves a great deal of book study, after hearing the teacher correctly pronounce the words in class. With these language tapes the pupil has the advantage of listening and seeing the words simultaneously, followed by oral drilling. While not outstanding, simple graphics also add to interest. Reviewers felt these tapes would be an excellent back-up when studying a foreign language.

Counter

by APX



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☐

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	B
Technical Quality	B	C

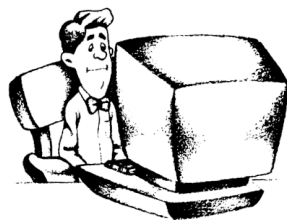
Comments:

Counter is a simple game in which the player can learn to count from one to fifteen in four languages: English, Spanish, French and German. There are six levels of difficulty. The graphics are fun, but would be even more helpful if the numerals were larger.

This game is most appropriate for preschoolers, but even older children enjoyed learning numbers in other languages.

Crush, Crumble & Chomp

by Automated Simulations,
Inc. (EPYX)



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	C	C
Content	C	C
Technical Quality	B	C

Comments:

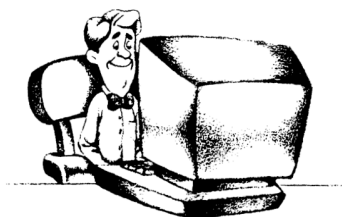
Anyone who plays *Crush, Crumble & Chomp* needs a lot of patience. Our testers were given the cassette version, and a number of them gave up before the game was loaded (about 15 minutes). Even after that, the "monsters" were slow to respond to the commands keyed in by the players.

In *CC&C* the player becomes a monster, either one provided by the computer, or self-designed. The monster is then turned loose to wreak havoc on one of four major cities. This is a violent game.

Documentation is excellent, and with *CC&C* a child will have to do a little work to figure out how to play. The game will teach maps and directions, although instead of "right" and "left," it would have been better to let the player key in "north," "south," "east," or "west."

Cubbyholes

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	C	B
Technical Quality	B	C

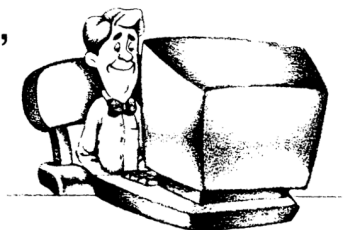
Comments:

Cubbyholes is an arithmetic game for one or two players. The object is to draw boxes around one-digit numbers in a grid so that the numbers in each box will add up to a number displayed below the grid. Naturally, these boxes will be of irregular shapes.

You can play at several levels of difficulty. The common complaint was the difficulty in drawing with the joystick. A big plus to this game is that not only does *Cubbyholes* help a child with simple arithmetic, but it should also help develop visual/spatial problem-solving skills.

Curse of Ra

by Automated Simulations,
Inc. (EPYX)



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒ 32K

Cassette ☐

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

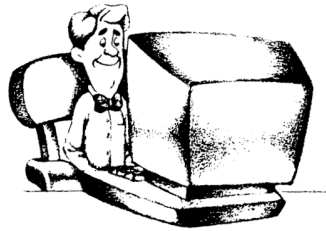
	Kids	Adults
Instructions	A	C
Content	A	B
Technical Quality	A	B

Comments:

See Temple of Apsahi. *Curse of Ra* is a continuation of *Temple*, where players venture even deeper into the dungeon. It is necessary to have *Temple of Apsahi* to play *Curse of Ra*. As with *TOA*, older children were fascinated with fighting off monsters and trying to acquire treasure. It is a good game for socializing, as boys and girls enjoy helping each other map the dungeon and suggest strategy.

Dog Daze

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

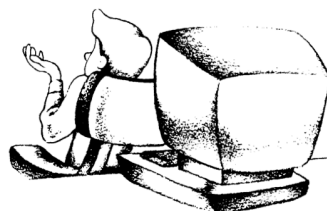
	Kids	Adults
Instructions	B	C
Content	A	C
Technical Quality	B	C

Comments:

Several kids mentioned they would enjoy any game that featured dogs. They all seemed to enjoy *Dog Daze*. In this game, two dogs race to claim fire hydrants. If one dog touches another dog's hydrant, he is immobilized for a few seconds as he stops to sniff the hydrant. *Dog Daze* may not be in the best possible taste, but on the other hand, it's a lot of fun.

Eastern Front

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	*	*
Content	*	*
Technical Quality	*	*

Comments:

In preparing *Buy a School For Your Home*, we notified numerous publishers of Atari software and asked for programs to review. *Eastern Front* was among those submitted. Even though this program is far too advanced for the majority of our audience of preschool through sixth graders, we present it here, without a letter grade, to bring it to your attention.

Eastern Front is a magnificent game of strategy. It is a simulation of Operation Barbarossa, the German invasion of Russia during World War II. This is a complex game; the manual must be read beforehand for play to make sense. With its superb graphics and attention to detail, *Eastern Front* could be enjoyed by many upper grade level children, perhaps gifted younger children, and many parents, whether or not they normally enjoy war gaming.

Elementary Biology

by APX



Grade Level and Type

Recreational ☐ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	F	C
Content	F	C
Technical Quality	D	D

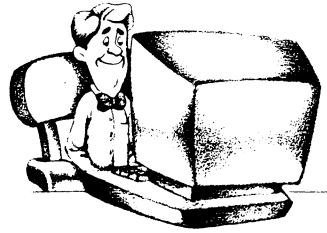
Comments:

Elementary Biology covers three topics: blood circulation in an animal with a two-chambered heart (in this case, a fish), a game simulating a food chain in a woods setting, and "Odell Lake" where students role-play fish and must select appropriate actions to survive. Although, overall, the graphics seem unsophisticated, "Odell Lake" is above average in both graphics and content.

This program is both interesting and appropriate for either a home or classroom setting. The accompanying documentation is a big plus.

Energy Czar

by Atari, Inc.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☐

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	D
Content	A	D
Technical Quality	A	C

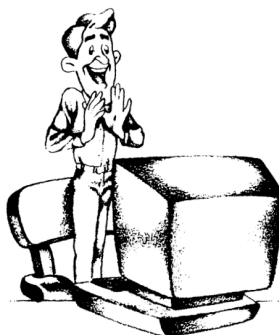
Comments:

Although not the latest game on the market, *Energy Czar* is one of the most timely. As newly appointed "Energy Czar" of the United States, the player must solve the energy crisis. To do this he or she must address the problems of energy sources, inflation, etc. This is a serviceable model to view complex consequences of actions.

The adults were unanimous in their feelings that the game was well intentioned but too complicated. The kids did not seem to mind if they missed all the details. Graphics are well done.

European Countries and Capitals

by Atari, Inc.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☐

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	A-
Content	A	A-
Technical Quality	A	B

Comments:

Although this program will not teach thinking skills or creativity, it was quite popular with our playtesters. A map of Europe is shown on the screen. The player must identify each country as it is outlined, and then name its capital. This can be challenging, as the countries and cities must be spelled correctly to be accepted. Everybody knows Rome, Italy, but correctly identifying the capital of Iceland can be tricky to say the least. (It is Reykjavik.)

The majority of the testers complained about the size of the map and said they would have enjoyed the game more with larger graphics. One parent commented that this game helped stimulate an interest in planning a dream trip to Europe.

Facemaker

by Spinnaker Software



Grade Level and Type

Recreational ☒ Preschool ☒
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☐ Joystick ☐ Paddle ☐

How They Rated It

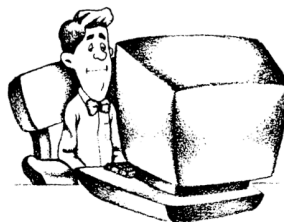
	Kids	Adults
Instructions	A	A
Content	A	A
Technical Quality	C	A

Comments:

Disguised behind a fun, appealing game, *Facemaker* is actually an introduction to programming for preschool and early elementary age children. Youngsters delight in designing a face—nose, eyes, ears, hair—and then when they press certain keys, the face is animated. (W = wink, C = cry, T = sticking out tongue, etc.) When children are pressing these keys to make ears wiggle or eyes wink, they are giving instructions to the computer, in other words, they are *programming* the computer to perform certain tasks. In addition to providing a simple introduction to programming and familiarity with the keyboard, *Facemaker* also helps exercise a child's creativity and improves memory and concentration. A real winner.

Fantastic Voyage

by Sirius Software



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☐

Cassette ☐

Cartridge ☒

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	C	D
Content	B	D
Technical Quality	C	D

Comments:

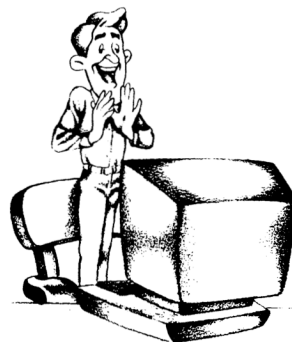
Fantastic Voyage was neither.

The idea of a miniature submarine injected into the bloodstream of a critically ill patient to destroy a life-threatening blood clot is great. (Maybe they will even make a movie about it sometime.) However, all that occurred was a poor maze game using primitive graphics and scrolling. The player uses the firebutton of his or her joystick to shoot at little blobs that appear as the "submarine" travels up the screen.

Our review: sighted submarine. Sank game.

Fast Eddie

by Sirius Software



Grade Level and Type

Recreational	<input checked="" type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input type="checkbox"/>	Cassette	<input type="checkbox"/>	Cartridge	<input checked="" type="checkbox"/>
BASIC Cartridge	<input type="checkbox"/>	Joystick	<input checked="" type="checkbox"/>	Paddle	<input type="checkbox"/>

How They Rated It

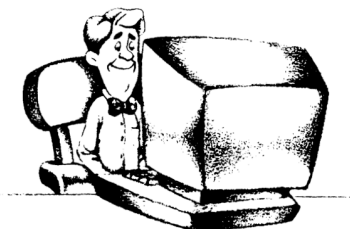
	Kids	Adults
Instructions	A	B
Content	A	A-
Technical Quality	A	A-

Comments:

With a simple format, *Fast Eddie* proved irresistible to young play-testers (Please, just once more . . . please!”), and a few not so young testers also. Eddie (who must have incredible breath control), appears to be at the bottom of a swimming pool. He must grab as many floating prizes as he can, while avoiding pesky little sneakers. With the aid of a joystick, players can move Eddie left or right, have him climb ladders, or jump over the little critters out to zap him. There are four Eddies per turn, five levels of difficulty. Screen graphics are fun.

Flags of Europe

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	C
Technical Quality	C	B

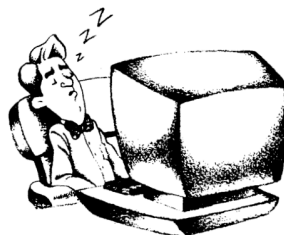
Comments:

A flag appears on the screen, and the player must guess its country of origin. This may be done as either multiple choice or fill-in-the-blank. Since the computer will only accept a correctly spelled answer, the program may also help or reinforce spelling skills. With correct answers, part of the country's national anthem or a native song will play. However, there is an annoying noise, loud and jarring, for an incorrect response.

While the subject matter may be of limited importance to school-children, the program is fun and much more interesting than learning the same material from a textbook.

Fraction Recognition and Mixed Number Recognition

by EDU-SOFT



Grade Level and Type

Recreational ☐ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 24K Cassette ☒ 16K Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	F	D
Content	F	D
Technical Quality	F	D

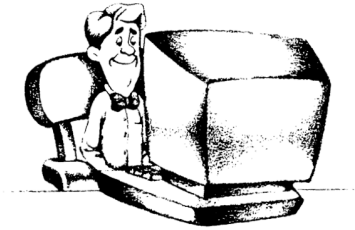
Comments:

A rectangle is divided into parts, some of which are shaded. The user is asked the number of parts in the box. Testers complained of dull graphics, lack of variety, and an uninteresting reward system.

Mixed Number Recognition is similar, but uses whole numbers plus a fraction.

Frog Master

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☒24K Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	B	C
Technical Quality	B	B

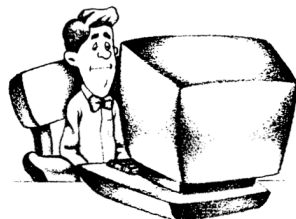
Comments:

Frog Master bills itself as a fast moving game on one level, while an educational exercise in animal conditioning on another. While parents and teachers were hardpressed to find any scientific or educational value, adults and kids alike found a lot of high energy fun in the game.

The setting is an underwater football field, and the goal is to get your tadpoles across the goal line before your opponent's tadpoles swim through your goal. There are several options and speeds, and the graphics are fun. Documentation is a delight. Tongue in cheek, it explains the rules of the game: "Left to themselves, the players just dart around at random, like so many dumb tadpoles"

Galactic Chase

by Spectrum Computers



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

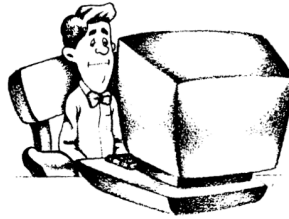
	Kids	Adults
Instructions	A	D
Content	A	D
Technical Quality	A	D

Comments:

This is modeled after the arcade game *Galaxian*. One or two players attempt to shoot invading alien spaceships. Lots of fast action. The sound quality is below average, although the graphics are appealing to the kids, who greeted the program with gusto.

Graph It

by Atari, Inc.



Grade Level and Type

Recreational <input type="checkbox"/>	Preschool <input type="checkbox"/>
Educational <input checked="" type="checkbox"/>	Elementary <input checked="" type="checkbox"/>

Requirements

Disk <input type="checkbox"/>	Cassette <input checked="" type="checkbox"/>	Cartridge <input type="checkbox"/>
BASIC Cartridge <input checked="" type="checkbox"/>	Joystick <input type="checkbox"/>	Paddle <input type="checkbox"/>

How They Rated It

	Kids	Adults
Instructions	F	A-
Content	F	C
Technical Quality	F	A-

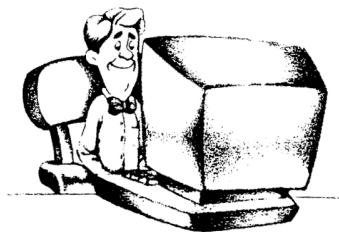
Comments:

Graph It plots statistical information and mathematical relationships. Parents and kids both agree on this one. Here are two sample reviews. From a twelve-year-old: "No sound but it might be good for a geometry class . . . the directions were almost impossible to follow unless you were a math genius." From a teacher: "It was my understanding this program was for K-6 level students. K-6 TEACHERS could not figure it out beyond bar charts and pie graphs. Really now!"

We believe *Graph It* would be frustrating for most K-6 youngsters, but worthwhile for older students.

Guess the Number/Reverse

by EDU-SOFT



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	D
Content	A	C
Technical Quality	C	C

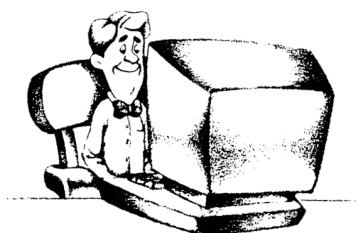
Comments:

Here are two unrelated games in one package. *Guess the Number* helps youngsters get a feel for the relative size of different numbers. The computer asks the player to guess a number. (These numbers can be programmed to be between 1 and 10, 1 and 50, etc., up to 1 and 999.) The computer tells the player if the numbers guessed are larger or smaller than the "secret number." Had the sound and graphics been more interesting, the game might be a little more exciting to play.

Reverse is an educational strategy game, geared for a higher age level. The object is to unscramble digits and put them in order in a series of moves called "reverses." A simple game, but quite challenging.

Guessword

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☐

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	B	C
Content	B	A-
Technical Quality	B	D

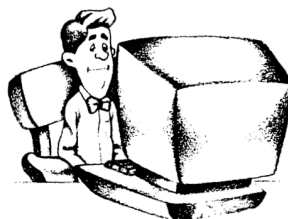
Comments:

Several educational programs are modeled after popular television programs. *Guessword* is the software version of TV's *Password*. In *Guessword*, a word appears on the screen and the player or players must guess its synonym. Additional one-word clues appear after each guess. The game is written for upper elementary level, but can be modified for younger players. New words can also replace the existing words, so the program can be played for years and always be new and fun.

Our young testers either loved or hated *Guessword*. The fans enjoyed the opportunity to enrich their vocabularies. Others said the words were too difficult. You might choose this game if your child is a language buff.

Hangman

by Atari, Inc.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☐

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	D	C
Content	C	D
Technical Quality	B	C

Comments:

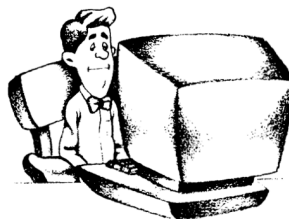
Hangman is a classic game almost everyone knows. One of the criticisms of Atari's *Hangman* is that too much time is spent on elaborate instructions.

Players can choose to play beginner, intermediate or expert levels. The computer draws from a 40-word vocabulary at each level. A joystick is optional, but if the game is used as a prelude to computer literacy, the keyboard might be preferred.

The *Buy a School for Your Home* authors did notice that a few of the kids would intentionally fail to spell their words, just to see what would happen to the condemned man. (SEE *Letterman*)

Hidden Words

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	C	C
Technical Quality	C	C

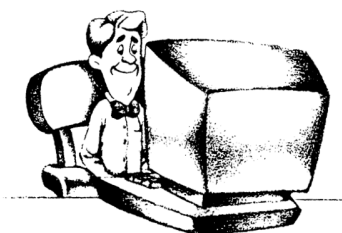
Comments:

A logophile is a lover of words. And incipient logophiles are sure to love *Hidden Words*. This puzzle contains a grid of 19×19 letters. A word is shown beneath the grid and the player must find the word hidden in the grid. Words may go right to left, left to right, up, down, or diagonally. Levels intended for younger players will highlight the hidden words in different colors, and there is longer time to locate the words.

Drawbacks: there's no sound, and the program takes a long time to load. Julius, a fifth grader, said about *Hidden Words* "It makes me use my brain." (See *Word Search Generator*)

Hodge Podge

by Artworx



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

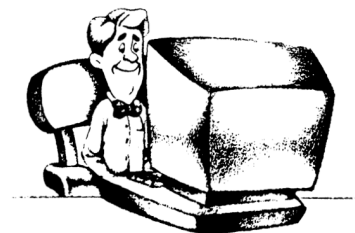
	Kids	Adults
Instructions	A	C
Content	A	B
Technical Quality	D	C

Comments:

Hodge Podge claims it is a “surreptitious learning” program for pre-school children. Since there are several levels to *Hodge Podge*, even older children can enjoy and benefit from this program. As any key is pressed, something relating to that key is heard or appears on the screen. For instance, when a child presses “H” he or she sees a horse on the screen and hears “Camptown Races.” “U” brings an up and down demonstration: a dot of color goes up and down steps, tones go up and down the scale. Enjoyable.

It's About Time

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☐

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	B	D
Content	C	C
Technical Quality	B	D

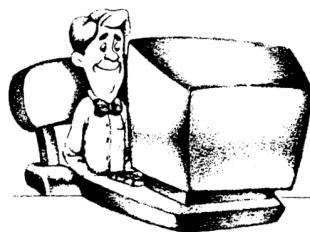
Comments:

Even though the world seems to be changing from analog clocks (think of Big Ben) to digital, kids still have to learn how to tell time. *It's About Time* might help, but adults found several technical flaws and the kids were divided about whether or not they enjoyed it. (Five-year-old Dane reported he "just loved all the o'clocks" though.)

Adults found fault with the documentation which was difficult to read and implement. They felt frustrated with the inability to skip to a different level or start again in the middle of a series. One aspect, "Beat the Clock," did not provide follow-up or give correct answers. With a few minor improvements, though, *It's About Time* could be a real winner.

Juggles' House

by The Learning Company
(TLC)



Grade Level and Type

Recreational <input checked="" type="checkbox"/>	Preschool <input checked="" type="checkbox"/>
Educational <input checked="" type="checkbox"/>	Elementary <input type="checkbox"/>

Requirements

Disk <input checked="" type="checkbox"/>	Cassette <input checked="" type="checkbox"/>	Cartridge <input type="checkbox"/>
BASIC Cartridge <input type="checkbox"/>	Joystick <input type="checkbox"/>	Paddle <input type="checkbox"/>

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	B
Technical Quality	A	C

Comments:

The Learning Company has a reputation for producing quality products. *Juggles' House* helps reinforce this idea. With *Juggles' House*, preschool children work with the spatial concepts of "inside" and "outside," as a house with delightful characters (furniture, dog, etc.) appears. A strip of blue paper placed across a row of keys proved to be distracting to some adults who played this program. The kids were uniformly enthusiastic.

Juggles' Rainbow

by The Learning Company
(TLC)



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☐

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☐

Joystick ☐

Paddle ☐

How They Rated It

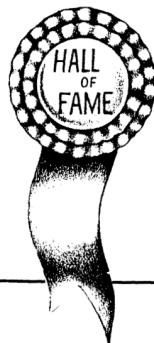
	Kids	Adults
Instructions	A	A
Content	A	A-
Technical Quality	A	A-

Comments:

Juggles' Rainbow is worth seeing for the color and graphics alone. Luckily for preschoolers, the colorful animations effectively introduce spatial concepts of right/left and above/below in a number of delightful exercises. It also introduces the four letters of the alphabet that are most difficult for preschoolers to learn: "b," "d," "p," and "q." The adults who previewed this one said they wished they could have had *Juggles' Rainbow* (and computers, we assume) when they were preschoolers.

JUKEBOX #1

by APX



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	A-
Content	A	A
Technical Quality	A	A-

Comments:

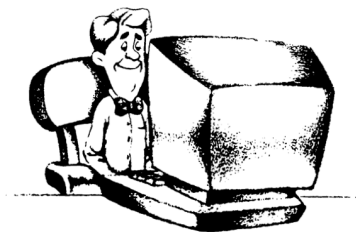
What a wonderful way to introduce children to classical music! With *Jukebox #1*, your child can choose from a selection of eight "light classics":

Nutcracker Overture;
Flight of the Bumblebee;
Air on the G-String;
Quartet in Eb, K, 428;
Brandenburg Concerto #5;
Well-Tempered Clavier;
Fur Elise;
and
Fugue in C Minor.

The screen shows a keyboard, each key being "played" turns various colors. For variety, players can change the tempo of each piece with paddle controllers.

Keyboard Organ

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☐

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	B
Technical Quality	C	A

Comments:

With this program you can “organize” your computer. Using the keyboard to play notes, the sounds that come forth are amazingly like an organ. Although you can only play one note at a time, you can learn to play songs and record and save them.

Although enjoyable, some knowledge of music is required to fully enjoy *Keyboard Organ*.

KinderComp

by Spinnaker Software



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☐

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	A-
Content	A	A
Technical Quality	B	B

Comments:

KinderComp offers six program choices, all fun. With "Scribble" any key you touch will be repeated for a full line on the screen. Your child's name, or short phrases, appear on the screen when he or she plays "Names." "Sequence" teaches number sequences. "Letters" and "Matching" are also taught. The winking face (when the answer is correct) is a delight. The kids seemed to enjoy "Draw" most of all. With a joystick they would make drawings, changing colors at will.

KinderComp looks like a program that will last. Because of the first-rate graphics and the variations, adults should enjoy playing this with their kids again and again. Our playtesters of all ages loved it.

Letterman

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 32K Cassette ☒ 16K Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

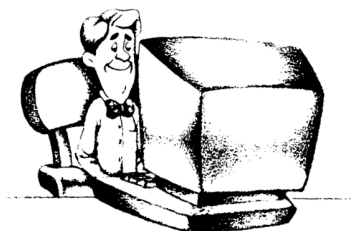
	Kids	Adults
Instructions	A	A-
Content	A	A
Technical Quality	C	A

Comments:

Letterman has taken the old classic, *Hangman*, and improved it. Rather than a violent end, *Letterman* offers appealing graphics and sound effects. The program contains more than 400 words in three difficulty levels, and when the player has learned these, it is easy to add new words (with 24k or more for cassette or 32k or more for disk). Owing to different memory requirements, the diskette offers some additional features: players can request hints, play under a time limitation, and the computer can keep track of up to nine players' scores and times. (SEE *Hangman*)

Mankala

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	C	C

Comments:

Mankala is an Atari version of a primitive game played with stones. One or two players attempt to move stones through a series of bins. The winner is the one who winds up with the majority of stones in his or her home bin. Play is done with anywhere between three and eight stones per bin. Although the authors have seen better implementations of this game on different machines, *Mankala* is fun and prompts strategic thinking.

MasterType

By Scarborough Systems, Inc.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☐ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	A-
Content	A	A
Technical Quality	A	A-

Comments:

When learning to type in one of those boring high school classes where everyone drills and drills, we would always peek at the keyboard. We never became competent typists since the disagreeable peeking habit prevented us from building up speed.

Aha! With *MasterType*, anyone can now learn to type well from scratch—or break negative typing habits—and have fun at the same time.

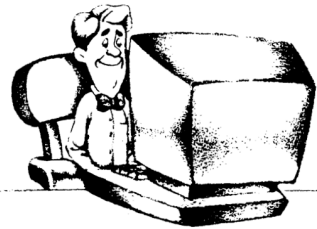
With its game format, *MasterType* forces you to concentrate on the screen, not the keyboard. Cheating doesn't help, because if you try to play at levels beyond your skill, you will not enjoy the game play.

You can remain in any lesson as long as you choose. After each game you are given a status report of your score, your mistakes, your average speed, and gentle encouragement when it's time to try a more difficult level of play (learning).

MasterType is a fun way to learn typing. It will also aid in spelling proficiency. (SEE *Touch Typing*)

Mathematic-Tac-Toe

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	C	C

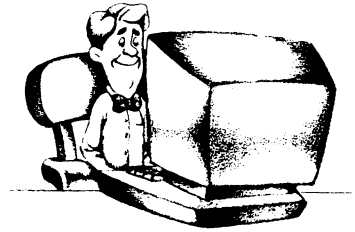
Comments:

Does your child think he or she doesn't like math? Even real math-phobes were intrigued with *Mathematic-Tac-Toe*. This is a two-player variation on the traditional tic-tac-toe game. A player chooses an unoccupied square on the nine-square grid and attempts to answer a math problem posed by the computer. A correct answer is rewarded with the appropriate X or O. If the answer is incorrect, the opponent may choose to play the same square, or another.

This game features four types of problems: addition, subtraction, multiplication, and division; 15 levels of difficulty for each kind of problem; and 15 time limit levels.

Math Facts— Level III

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☐ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☐ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	B	C
Technical Quality	B	C

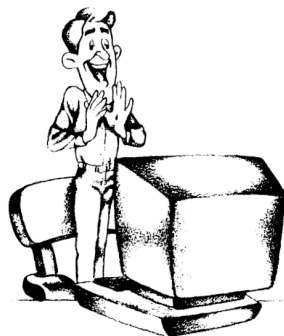
Comments:

Math Facts—Level III is a self-paced instructional program. Units include addition (two and three columns, carrying) and subtraction with borrowing. Feedback is especially good in that the program is encouraging and nonjudgmental. Players are first shown examples of how to solve the equations.

This program has much merit, and just misses top marks all the way around. Areas that could be improved: the program is annoyingly slow, sometimes the numbers are hard to read. The “cosmic creature” who stomps his foot waiting for your answer is cute at first, but can easily get on your nerves. It might be an even more valuable exercise if students make the decision themselves as to borrow or not borrow, carry or not carry.

Memory Match

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	A
Content	A	A
Technical Quality	C	A

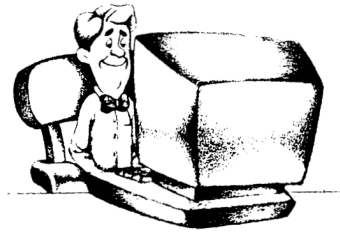
Comments:

Another computerized version of TV's *Concentration*. Players must match 26 pairs (42 boxes). Players have a choice of pictures, words, symbols or letters. Words are deceptively difficult when such simple words as BUY-BYE-WON-ONE-FAN-FUN-SUN-SON are used. This program could offer some clues as to how your child best learns.

Memory Match did not seem to hold our young playtesters' interest for extended periods of time, but it is an excellent aid for memory building. (SEE *Con*Putation*)

Metric and Problem Solving

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☒

How They Rated It

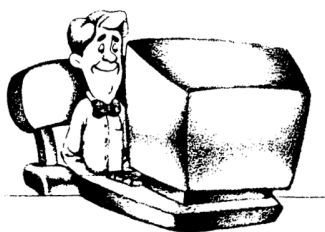
	Kids	Adults
Instructions	A	A-
Content	A	B
Technical Quality	C	C

Comments:

Designed for second through sixth grade users, *Metric and Problem Solving* provides drill and practice in working with metric units, estimation and conversion. Four additional games teach logic, coordinate systems, point location, and factors of a number and prime numbers. *Metric and Problem Solving* can be used at home or in the classroom. Excellent documentation helps reinforce what the child sees on the screen.

Missile Command

by Atari, Inc.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☐

Cassette ☐

Cartridge ☒

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	A	A—

Comments:

In this home version of the popular arcade game, players fire their missiles at enemy missiles. It is a fast moving game, with interesting sound and graphics. The kids seemed to enjoy it a lot, although the boys were very enthusiastic, the girls divided. The parents appreciated the technical aspects, as well as the game content. As one parent put it, "Good game, dreadful implications."

Monkey Up A Tree

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	C	B
Content	A	A
Technical Quality	B	A

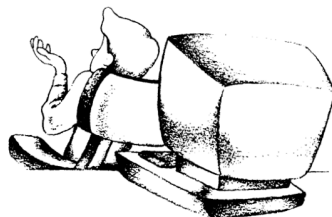
Comments:

We have a feeling kids will play *Monkey Up A Tree* because it is so much fun, and not realize what a good math drill they are getting. One or two players will set a monkey or monkeys scampering up a tree with each correct answer. Three trips for bananas (this is a hungry monkey) will win the game.

A splendid handicapping feature—speed and accuracy will produce more difficult problems—will allow adult and child or siblings of different ages and abilities to play together. Players are asked to solve addition, subtraction, and division problems. Good musical validation. Fun game.

Monster Maze

by Automated Simulations,
Inc. (EPYX)



Grade Level and Type

Recreational	<input checked="" type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input type="checkbox"/>	Cassette	<input type="checkbox"/>	Cartridge	<input checked="" type="checkbox"/>
BASIC Cartridge	<input type="checkbox"/>	Joystick	<input checked="" type="checkbox"/>	Paddle	<input type="checkbox"/>

How They Rated It

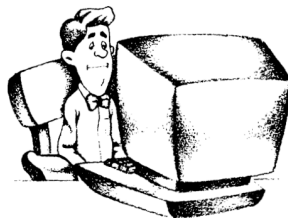
	Kids	Adults
Instructions	C	*
Content	D	*
Technical Quality	C	*

Comments:

Monster Maze was a good idea, but something was lost in the execution. A little like *Pac-Man*, but here the player must maneuver through a 16-floor, three dimensional maze. An interesting feature is an overhead view of the maze. However, our young playtesters had either one of two reactions: initial interest but ultimate confusion, or immediate boredom. The program arrived too late for adult testers to view it.

Music Composer

by Atari, Inc.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☐

Cassette ☐

Cartridge ☒

BASIC Cartridge ☐

Joystick ☐

Paddle ☐

How They Rated It

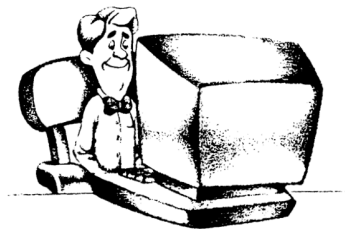
	Kids	Adults
Instructions	D	C
Content	C	B
Technical Quality	D	C

Comments:

There are several programs available to help users utilize the ATARI computer's great sound and graphics capabilities. *Music Composer* helps create and play music. While the program has overall value, kids and adult testers felt *Music Composer* was too advanced for the majority of elementary grade level children. We include it here, however, because it could be of value for those who have had some musical background.

My First Alphabet

by APX



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☐

Requirements

Disk ☒ 24K

Cassette ☐

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	B	C
Technical Quality	B	B

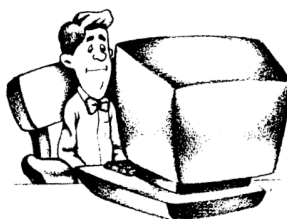
Comments:

“A” is for apple, of course, and in *My First Alphabet* the apple is a delicious looking piece of fruit, glowing on the screen. The graphics are quite good throughout. A preschooler can press any key, and that letter with an illustration (“Z” is for “Zebra”) will be displayed. Other words beginning with that letter (Zoo, Zipper, Zero) will be shown in smaller letters.

Our playtesters—preschoolers and kindergartners—seemed to enjoy the program, but most decided once was definitely enough.

Nautilus

by Synapse Software



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	B	D
Content	A	D
Technical Quality	A	D

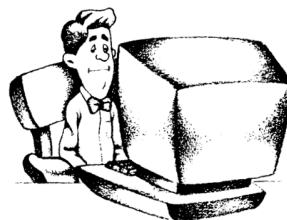
Comments:

A definite generation gap here. Adults found *Nautilus* confusing, difficult and slow. Some parents pointed out a significant technical problem that prevented one time/score bar to be completely viewed on the lower part of the screen.

The majority of the kids loved the sounds, graphics, and destruction. Eleven-year-old Jeff loved everything but the frogs. Danny liked all the action but found the instructions too hard. Brandon, a fifth grader, liked "blowing up the cities," but Fred thought the submarine should have had a definite mission. Interestingly, the boys gave *Nautilus* much higher scores than did the girls.

Number Blast

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	D
Technical Quality	C	C

Comments:

Number Blast is a one- or two-player game of addition and multiplication, offering three levels of speed. Correct answers blast numbers off the screen and give you points, wrong answers deduct points. Wish we could say this is a blast for everyone, but only the kids accepted the program wholeheartedly. Adult testers said "average graphics . . . average fun." Math drill has merit, though.

Paint

by Capital Children's Museum Inc.



Grade Level and Type

Recreational ☒ Preschool ☒
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	B	A
Content	A	A
Technical Quality	A	A

Comments:

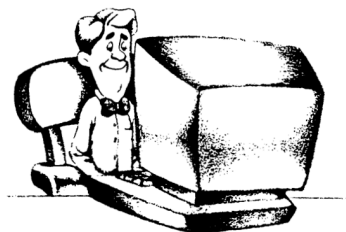
Paint is an astonishing program that fascinates and excites almost everyone who plays it. *Paint* allows children and adults to find and explore the artist inside us all. With this program, you can "paint" all sorts of exciting pictures on your screen and save them on a disk. This program does for an artist what word processors do for writers.

Paint offers an amazing variety of colors, patterns, and techniques. You begin with a palette of "paint pots," and by using your joystick to control the brush, you can let your imagination take over. Change colors, brush sizes, textures. You can even create elegant Gothic script with a calligrapher's brush. Kids especially loved the "zoom" feature which can magnify a portion of the screen up to sixteen times its size.

Paint was developed by the Capital Children's Museum in Washington, D.C. It includes a terrific book that tells not only how to *Paint*, but also about computers, the history of art, special effects, and more. The "Idea Shop" section is a present to all who read it.

Personal Fitness Program

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 24K Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	B	B
Content	A	A-
Technical Quality	C	C

Comments:

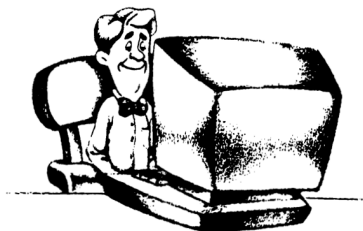
Parents who worry about their youngsters staring with glazed eyes for hours at a computer monitor should be aware of the APX *Personal Fitness Program*. This appears to be of even more interest to adults.

The program offers a personalized fitness program, based on your current state of health, age, sex, etc. Users are encouraged to exercise correctly and consistently. *Personal Fitness Program* contains exercises promoting general fitness conditioning. It sequences these exercises for comfort and efficiency, adjusts the exercise sequence to your personal fitness level, and encourages you to stay with your daily program by reporting your progress on daily and weekly charts.

The authors did not consider this as a Hall of Fame program, because it was not directed primarily toward kids. However, it is still a winner.

Picnic Paranoia

by Synapse Software



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	D
Technical Quality	A	B

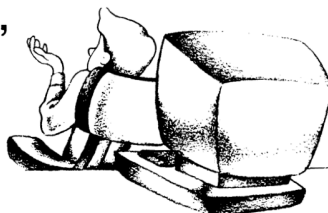
Comments:

While *Picnic Paranoia* is not exactly a push for the great outdoors, the kids seemed to enjoy it. Hapless "George," armed only with a fly swatter (bug spray cans come later) has to rush around removing ants, before they remove all the food on his four picnic tablecloths. Ill-tempered wasps and annoying spider webs hamper him. Ten-year-old Greg best loved "the way you have to make exactly the right moves to get the ants." And Kristen, a kindergartner, even enjoyed "getting stung by a bee" (wasp).

The adults found it fast but one-dimensional, frustrating because the insects always far outnumbered the fly swatting capabilities. The beginning graphics, accompanied by "Flight of the Bumblebee" were a hit.

Plattermania

by Automated Simulations,
Inc. (EPYX)



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☐ Cassette ☐ Cartridge ☒
BASIC Cartridge ☐ Joystick ☒ Paddle ☒

How They Rated It

	Kids	Adults
Instructions	A	*
Content	B	*
Technical Quality	B	*

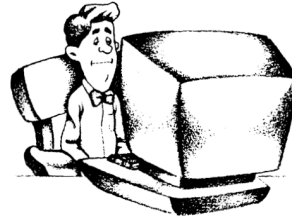
Comments:

This is a fun game with a circus theme. The object of *Plattermania* is to control a clown balancing platters on poles. The sound is quite good, and ability and timing are required to rack up high scores. Our young playtesters found fault with the long wait between players when more than one person plays. Also, because there are no variations, players could lose interest more easily than with some other games.

(Not tested by adults)

Player Piano

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

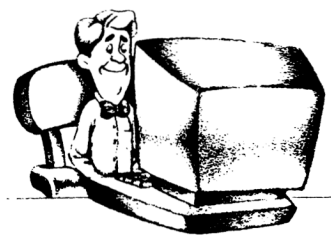
	Kids	Adults
Instructions	A	C
Content	A	D
Technical Quality	C	D

Comments:

The idea of *Player Piano* is to turn your home computer into a 26-note mini-piano. When you press certain keyboard keys, the computer will produce the corresponding note. There are four options: play piano, read data, create data, and end program. If you have a printer, you may save your data. There are many limitations to *Player Piano*, one of the biggest being you can only play one note at a time. This program struck a sour note with the testers.

Plot: Guess The Rule

by EDU-SOFT



Grade Level and Type

Recreational ☐ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 24K Cassette ☒ 16K Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	B	B

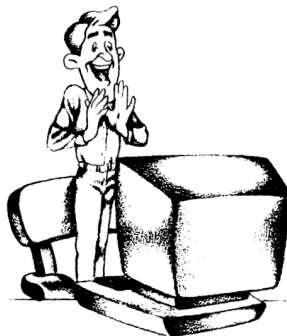
Comments:

Although *Plot* may be a little too advanced for our age group, *Guess the Rule* (both games on same disk/cassette) proved to be a fun algebra guessing game. The computer gives hints in the form of ordered pairs, and the player must guess the secret equation. There are 11 levels of difficulty, so this program can be used by elementary grades, high school or college students.

The program does an excellent job of explaining instructions, and even personalizes the game by frequently naming the player.

Pool 1.5

by Innovative Design
Software, Inc. (IDSI)



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒ 48K

Cassette ☐

Cartridge ☐

BASIC Cartridge ☐

Joystick ☐

Paddle ☒

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	B
Technical Quality	A	A-

Comments:

Even playtesters who had no experience with the real thing enjoyed *Pool 1.5*, an electronic billiards game. *Pool 1.5* may be played with one to four players.

Game choices are "Straight Pool," "Eight Ball," "Rotation," or "Nine Ball;" the documentation includes rules for each of the game variations. Graphics are nice, and pool shots seem to behave just as they would on green felt.

Pre-School Fun

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒ Preschool ☒
Educational ☒ Elementary ☐

Requirements

Disk ☐ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	F	D
Content	F	B
Technical Quality	F	C

Comments:

Pre-School Fun offers several games on one cassette—colors, shapes, counting, matching shapes and letters, identifying odd letters and directions.

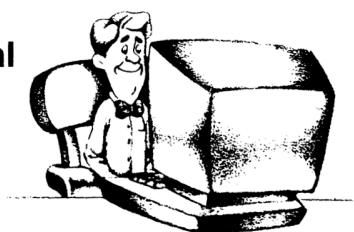
The program contains all the right elements, but our testers voiced several complaints, mostly to do with graphics: the letters are too small, the circle looks more like an oval, some letters look like numbers. Players were also frustrated when they were unable to get out of a module to go on to a different game.¹

A favorite section appeared to be “Directions,” where children are introduced to the concepts of up, down, left and right. When a child chooses the correct key, a spaceship on the screen flies in that direction. Although the graphics are average, the sound effects reward is great.

¹ Many of these complaints, however, are resolved in *Pre-School Fun Version II*.

Preppie

by Adventure International



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	C	D
Technical Quality	A	B

Comments:

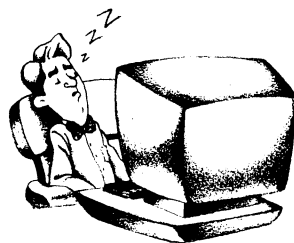
Even if preppie fashions are going out of style, the reactions of the kids to playing *Preppie* suggest the game will be around quite a while longer.

Using a joystick, a player maneuvers "Preppie" across a golf course, trying to avoid numerous hazards along the way. Most of the game is spent trying to pick up wayward golf balls. Both the music and the graphics are great fun. Our young playtesters really enjoyed the alligators, careening golf carts, and giant frogs. Michael, a first grader, wanted to play the game over and over because "I want to keep seeing the man get squished."

In our experience, golf can be a frustrating game, but we never realized it was that dangerous!

Presidents of the U.S.

by APX



Grade Level and Type

Recreational <input type="checkbox"/>	Preschool <input type="checkbox"/>
Educational <input checked="" type="checkbox"/>	Elementary <input checked="" type="checkbox"/>

Requirements

Disk <input checked="" type="checkbox"/> 32K	Cassette <input checked="" type="checkbox"/> 24K	Cartridge <input type="checkbox"/>
BASIC Cartridge <input checked="" type="checkbox"/>	Joystick <input type="checkbox"/>	Paddle <input type="checkbox"/>

How They Rated It

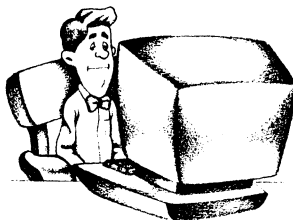
	Kids	Adults
Instructions	F	B
Content	F	D
Technical Quality	C	D

Comments:

Most elementary schoolchildren (and a lot of parents) only have a sketchy knowledge of our country's presidents. This program teaches the names of all the presidents and gives four clues, including the dates of office. Students can choose to play multiple choice or fill-in-the-blank. As with most of these games, the computer will accept only the correct spelling of the name. It is not necessary to go through all the names if you want to restart the program. Parents suggested better clues would help the program. Children felt the computer could be put to better use than just memorization of presidential succession.

Protector II

by Synapse Software



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☒
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

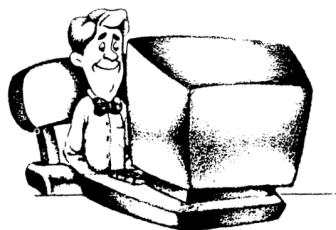
	Kids	Adults
Instructions	B	C
Content	A	D
Technical Quality	B	C

Comments:

There is a *Protector*, but *Protector II* is the improved version. According to our arcade-type game aficionados, there IS a difference. This one is far superior. The object of the game is to transport 18 people from a city under attack by the Fraxullan Slimehordes (most space games seem to have imaginative character names) beyond Dragonmaw (the volcano of death) to the City of New Hope, and then to the Verdann Fortress. Of course, there are assorted hindrances and obstacles along the way. The kids enjoyed it, especially the story line and graphics.

Quarxon

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

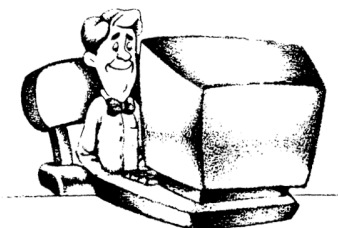
	Kids	Adults
Instructions	A	C
Content	A	D
Technical Quality	A	B

Comments:

Kids enjoyed this arcade-type game in which two ships engage in fighting to protect their bases from enemy fire. Although the game might be advanced for primary grade youngsters, the upper elementary grade testers were impressed with the sound, graphics and ease of play. It is pretty much self-documenting (a real plus), but when necessary to read the written documentation, instructions are clear and complete.

Rabbotz

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

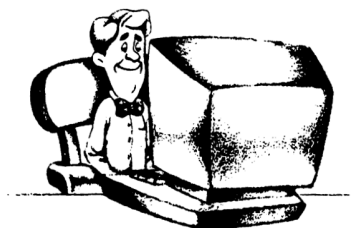
	Kids	Adults
Instructions	A	B
Content	A	D
Technical Quality	A	C

Comments:

Rabbotz (say it aloud) is a game of speed and strategy for one or two players. Rather than cute, furry, Thumper-type animals, these Rabbotz are mean, nasty and are out to get anything in their way. Players must lay mines that will defuse the Rabbotz. The Rabbit Transit System can transport you around the screen, but it transports the Rabbotz also. Speed is essential because these disagreeable critters reproduce through fission (described in the documentation as “splitting hares”). Fifth grader Herbert said he especially enjoyed having to think ahead when he would lay a mine and move to a strategic position. More than one parent objected to the idea of destroying rabbits.

Raster Blaster

by Budge Co.



Grade Level and Type

Recreational	<input checked="" type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input checked="" type="checkbox"/>	Cassette	<input type="checkbox"/>	Cartridge	<input type="checkbox"/>
BASIC Cartridge	<input type="checkbox"/>	Joystick	<input checked="" type="checkbox"/>	Paddle	<input type="checkbox"/>

How They Rated It

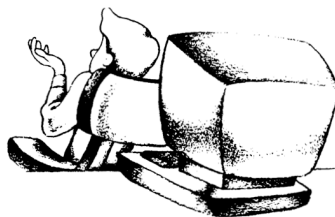
	Kids	Adults
Instructions	A	C
Content	A	D
Technical Quality	A	A-

Comments:

Raster Blaster is an electronic pinball game that kids love. It leaves adults nostalgic for the real thing. The ATARI computer has excellent graphics capabilities, and this game makes the most of it. *Raster Blaster* graphics are sensational.

Repton

by Sirius Software



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

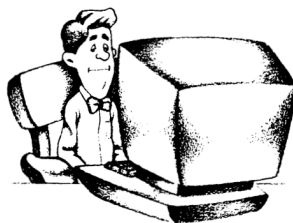
	Kids	Adults
Instructions	A	*
Content	A	*
Technical Quality	A	*

Comments:

Repton is similar to the arcade game *Defender*. According to the story line, various aliens are attacking your city. You try to destroy them before they destroy you. Our young players enjoyed the technical quality. Documentation is quite good. Not available for adult review.

Reversi II

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

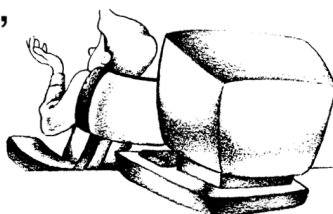
	Kids	Adults
Instructions	A	C
Content	F	C
Technical Quality	F	C

Comments:

Reversi II is the electronic-age version of *Othello*. You play either another opponent or the computer itself, attempting to gain the majority of squares on an 8×8 red and green board. This is a good game for strategy planning. Since you must surround your opponent on two parallel sides to capture his squares, the game may change dramatically in each move.

Ricochet

by Automated Simulations,
Inc. (EPYX)



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☐

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	*	*
Content	*	*
Technical Quality	*	*

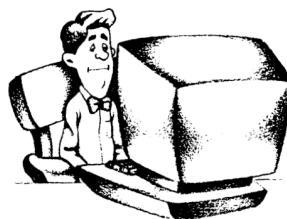
Comments:

Although *Ricochet* was too advanced for most of our playtesters, we are including it because players experienced with computer games will find it a real challenge.

Playing *Ricochet* is a little like playing a pinball game—but the computer is your adversary. Until you have played it a few times, it appears to be a game of chance. However, the player who studies the angles, and learns how to arrange his deflections, will find *Ricochet* a game of skill requiring some plan-ahead strategy.

Reading: What's Different

by PDI



Grade Level and Type

Recreational	<input checked="" type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input checked="" type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input checked="" type="checkbox"/>	Cassette	<input checked="" type="checkbox"/>	Cartridge	<input type="checkbox"/>
BASIC Cartridge	<input checked="" type="checkbox"/>	Joystick	<input type="checkbox"/>	Paddle	<input type="checkbox"/>

How They Rated It

	Kids	Adults
Instructions	A	B
Content	F	B
Technical Quality	B	C

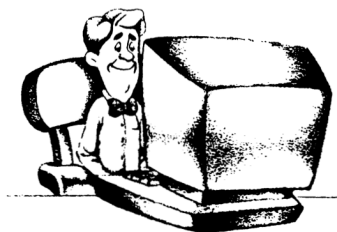
Comments:

There are ten games in *What's Different*. All ask the player to point out the word that does not belong in the list of four words. All games are similar, but the level of difficulty ranges from grades 1 to 2 (game 1) to grade 6 and lower (games 8–9–10).

Parents and teachers gave *What's Different* very high marks, but our young playtesters—five eight-, nine- and ten-year-olds—thought the games were far too easy for their intended users.

Sammy the Sea Serpent

by Program Design, Inc.
(PDI)



Grade Level and Type

Recreational ☒

Preschool ☒

Educational ☒

Elementary ☐

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	C	B
Technical Quality	B	C

Comments:

A child listens to a story of the adventures of *Sammy the Sea Serpent* (who looks more like an inchworm than a sea serpent). At the same time the player guides Sammy along several mishaps and adventures. The preschoolers who tested this program thought it was first-rate fun. Five-year-old Lisa even personalized it by assuming the role of Sammy herself.

Seven Card Stud

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 32K Cassette ☒ 24K Cartridge ☐
BASIC Cartridge ☒ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	A
Content	A	B
Technical Quality	A	A

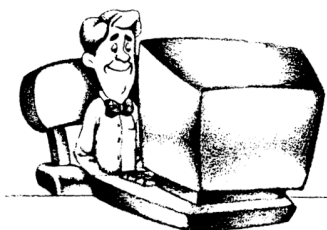
Comments:

When you can't round up the boys (or girls) for an evening of poker, and Las Vegas is impractical, you can still thoroughly enjoy yourself with *Seven Card Stud*. The computer offers five other "players" to compete against. A neat option is directing the computer to change the way your fellow card sharks will play against you. The graphics are superb. The only thing lacking, according to one parent, is doubling down ability (that must have been the parent with the green eyeshade). We also missed players with female names. Women play poker too!

Oh, yes. Kids. The youngsters who playtested *Seven Card Stud* loved trying to remember cards and calculate odds. A real winner.

Shamus

by Synapse Software



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	A-
Technical Quality	D	B

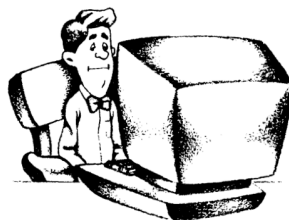
Comments:

Shamus is much more than just a quick moving game. It is an adventure puzzle. You, the Shamus (detective), must find your way through a maze of four levels, each containing 32 rooms, to the lair of your arch-enemy, SHADOW. Many of the rooms have multiple exits, and very quickly you realize to succeed, you will have to draw a detailed map. Beyond the first black (easiest) level, it will help to play with a friend who will assist with the mapping strategy. There are many imaginative obstacles along the way. As you progress you are expected to pick up various colored keys to open the keyholes you see. Pulsating question marks frequently appear. If you pass over these, you will invite either bonuses or disaster.

Unlike many other games, *Shamus* can only be mastered by quick reflexes, strategy, and hours of practice.

Simulated Computer

by EDU-SOFT



Grade Level and Type

Recreational	<input type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input checked="" type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input checked="" type="checkbox"/> 24K	Cassette	<input checked="" type="checkbox"/> 16K	Cartridge	<input type="checkbox"/>
BASIC Cartridge	<input checked="" type="checkbox"/>	Joystick	<input type="checkbox"/>	Paddle	<input type="checkbox"/>

How They Rated It

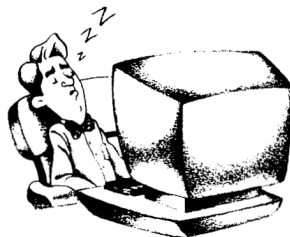
	Kids	Adults
Instructions	A	D
Content	A	D
Technical Quality	C	C

Comments:

Simulated Computer demonstrates the basic principles of the operation of a real computer. It does not teach programming. The kids enjoyed the program. Adults complained there was too little information given on the screen, necessitating too much reliance on the manual—in other words, not good usage of the computer's capabilities. It was also felt that some computer knowledge was required before the information given could be understood.

Snark Hunt

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

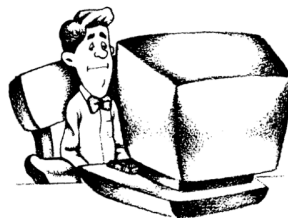
	Kids	Adults
Instructions	D	D
Content	C	F
Technical Quality	C	D

Comments:

See ratings. 'Nuff said?

Space Chase

by APX



Grade Level and Type

Recreational ☐

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	C	B
Content	A	D
Technical Quality	A	F

Comments:

Another space game. In this one the player maneuvers a spaceship across the screen to "eat" planets, while evading attacking drones. Adults were unimpressed, kids seemed to enjoy it a little more. The main complaint from a couple of the youngsters was that since the player only has one "life," the game ends too quickly.

Spatial Relations

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☐

Preschool ☒

Educational ☒

Elementary ☐

Requirements

Disk ☐

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	F	D
Content	C	C
Technical Quality	F	C

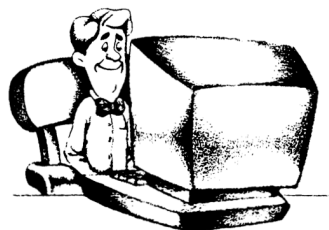
Comments:

Spatial Relations is designed to prepare a child for reading and math skills by introducing him or her to comparative sizes. The six units deal with: big/small, tall/short, high/low, over/under, right/left, in/out.

Although containing good information, *Spatial Relations* was faulted by testers for incomplete documentation, taking too long to load, and lack-luster graphics. Side 2 of the program is valuable for anyone who owns a Type-N-Talk® speech synthesizer. The programs are identical to Side 1, but each time an object appears on the screen, the speech synthesizer will "say" what is printed.

Spellbound

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☐

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	C	D
Content	B	C
Technical Quality	A	D

Comments:

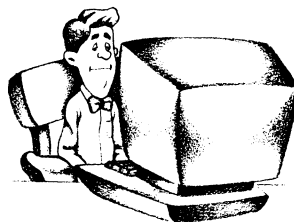
Do you want your own private spelling bees at home? *Spellbound* can offer you any one of 30 levels of words. If you would rather type in your spelling list for the week, *Spellbound* will let you do that also.

Little critters on the screen jump and squeal with approval when you have typed in the word correctly after it once flashes on the screen. The program is nonpunitive when it comes to misspelled words: the correctly spelled word is displayed on the screen long enough for you to memorize it.

Testers found this a less-than-exciting program. One of the biggest drawbacks was the length of time it took the program to load. (SEE *Spelling Genie*)

Spelling Genie

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒ 24K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	C	C
Content	C	B
Technical Quality	C	C

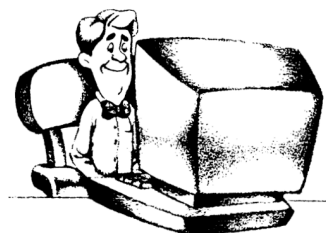
Comments:

You probably never realized the variety of ways spelling games could be played until *Spelling Genie* came along. A player can learn from nine word lists, or can type in his or her own words. (This option could even help with foreign language vocabulary.) One or two players can play.

With *Spelling Genie* you can unscramble mixed up words, spell a word that flashes on the screen for a mere instant, figure out a word with missing vowels, or activate a whizzing target to spell words quickly. There is even a "tournament option" in which you can play all the options without stopping between games. (SEE *Spellbound*)

Star Raiders

by Atari, Inc.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☐ Elementary ☒

Requirements

Disk ☐ Cassette ☐ Cartridge ☒
BASIC Cartridge ☐ Joystick ☒ Paddle ☐

How They Rated It

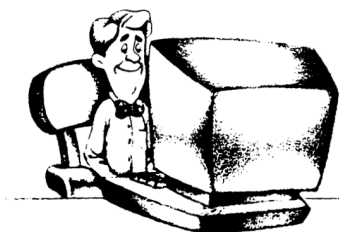
	Kids	Adults
Instructions	B	C
Content	A	B
Technical Quality	A	B

Comments:

If you have not heard about *Star Raiders* yet, you will. Your kids are sure to mention it. This is THE classic space game. The game makes excellent use of all the computer's functions. Our playtesters loved the sound, graphics and the level of involvement. As more than one youngster wrote, "I loved the whole thing!"

Starware

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	A-
Technical Quality	D	C

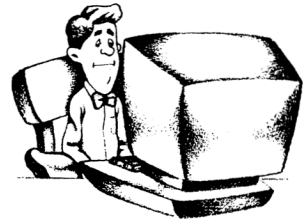
Comments:

Although *Starware* is recommended for teens and older, it is an excellent program for budding astronomers and worth including for review. With *Starware*, the user can view all of the constellations in the Northern and Southern Hemispheres, from 1900 up to the current day. In the first viewings only stars are shown, but lines defining each constellation may be drawn in if the user wishes. Another option is the display of a simple constellation. To further assist students, a quiz is included. For someone who wants to go beyond the basics, Local Sidereal Time can be computed.

The only drawbacks testers could find to *Starware* were the long wait for constellations to be plotted on the screen, and the documentation. While supporting data is accurate, an additional astronomy reference book would help to get the most out of this program.

States and Capitals

by Atari, Inc.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☐ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	F	A
Content	B	B
Technical Quality	F	A-

Comments:

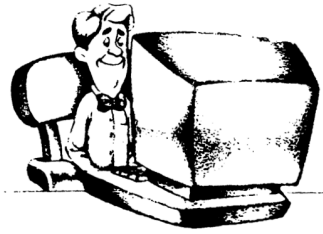
Did you ever have one of those jigsaw puzzles of the United States where each state was a separate puzzle piece? They were great fun on a rainy day, whether you were a geography whiz or not.

This generation of kids can now view the national map on a computer screen. The outline of a randomly selected state will appear in its proper place on the map. The player must type in the name of the state, correctly spelled, and then the state capital.

Kids and adults enjoyed *States and Capitals*. The biggest criticism was that the answer leaves the screen too quickly, not allowing the player time to study it.

Stocks and Bonds

by Avalon Hill



Grade Level and Type

Recreational	<input checked="" type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input checked="" type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input checked="" type="checkbox"/>	Cassette	<input type="checkbox"/>	Cartridge	<input type="checkbox"/>
BASIC Cartridge	<input checked="" type="checkbox"/>	Joystick	<input checked="" type="checkbox"/>	Paddle	<input type="checkbox"/>

How They Rated It

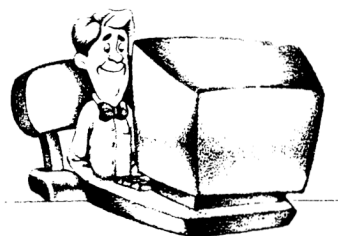
	Kids	Adults
Instructions	A	C
Content	A	B
Technical Quality	B	C

Comments:

Although a game, *Stocks and Bonds* does a fair job of teaching the rewards and pitfalls of the stock market. With \$5,000 to play with, up to four players try to accumulate the most amount of money in ten investments over a ten year period of time. This could be an interesting game for the entire family.

Super Breakout

by Atari, Inc.



Grade Level and Type

Recreational	<input checked="" type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input type="checkbox"/>	Cassette	<input type="checkbox"/>	Cartridge	<input checked="" type="checkbox"/>
BASIC Cartridge	<input type="checkbox"/>	Joystick	<input type="checkbox"/>	Paddle	<input checked="" type="checkbox"/>

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	A-
Technical Quality	B	C

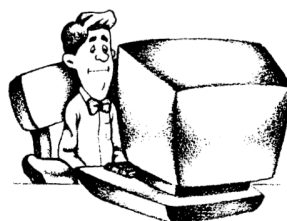
Comments:

Super Breakout is ridiculously simple, yet once people get started they do not want to stop. For anyone who has not seen it, the idea is to use a ball, controlled by a paddle, to break through a wall of bricks. It takes little thought, but a lot of eye-hand control. It can be very relaxing.

Of the four variations, our kids seemed to most enjoy "Cavity," where two other balls are trapped within the bricks, but can be put into play. Although not mentioned in the directions, the kids discovered if they pressed the red button on the paddle twice, two balls would be released. They seemed to enjoy the challenge.

Teacher's Pet

by Artworx



Grade Level and Type

Recreational ☐ Preschool ☒
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☒ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	D
Technical Quality	C	D

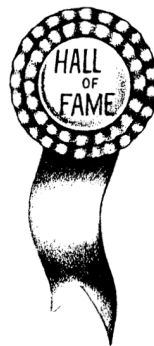
Comments:

In school, a teacher's pet is usually not the most popular person in the classroom. *Teacher's Pet* doesn't get high marks for popularity either. The program is designed for youngsters, ages three to eight, to be the "first personal introduction to the world of computers, computing and computer-aided instruction." The areas offered are: arithmetic, letter recognition, counting practice, and "answer man."

While an excellent concept, the users were disappointed with the program's rigidity, poor graphics, and lack of validation and reinforcement. The "Answer Man" option merely flashes a word or sentence on the screen ("Perhaps," "Maybe") supposedly in response to a verbal question asked by the program's user.

Teasers by Tobbs

by Sunburst Communications



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 16K Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

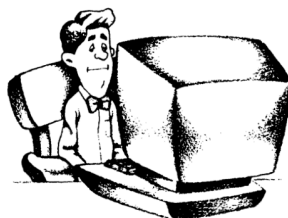
	Kids	Adults
Instructions	A	A
Content	A	A
Technical Quality	A	A-

Comments:

Although billed as a teacher's guide, *Teasers by Tobbs* can easily be used at home. If so, it will probably provide as much fun for the parents as learning and enjoyment for the child. *Teasers by Tobbs* offers puzzles for kids from the third- to twelfth-grade level. Rather than straight addition or multiplication, the puzzles also require some spatial perception and logical thinking. This is a good one.

Temple of Apshai / Upper Reaches of Apshai

by Automated Simulations,
Inc. (EPYX)



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	C
Technical Quality	A	A-

Comments:

These two programs are reviewed together, since *Upper Reaches of Apshai* contains additional scenarios based on the original *Temple of Apshai*. Since Chapter Eight explains how the game is played in great detail, we'll only include the reactions of playtesters here.

Apshai is a fascinating game, taking many hours to play. Young children tend to become easily bored with it, but older kids love it. The documentation is not complete. Sometimes you need to press return, sometimes not. Often it is not necessary to type in an entire answer or command, only the first letters. Minor quibbles, but confusing to novice players.

One young man said the game was great but since there was no concrete objective, it was hard to "win." Adults had mixed opinions. One felt the beginning (bargaining for weapons) was fun and instructive, but the dungeon part, needing no strategy, was boring. Another parent said, "Its very complexity and diversity make it much more acceptable to me than many games whose sole purpose is increasing scores."

The Factory

by Sunburst Communica-
tions



Grade Level and Type

Recreational	<input checked="" type="checkbox"/>	Preschool	<input type="checkbox"/>
Educational	<input checked="" type="checkbox"/>	Elementary	<input checked="" type="checkbox"/>

Requirements

Disk	<input checked="" type="checkbox"/> 16K	Cassette	<input type="checkbox"/>	Cartridge	<input type="checkbox"/>
BASIC Cartridge	<input checked="" type="checkbox"/>	Joystick	<input type="checkbox"/>	Paddle	<input type="checkbox"/>

How They Rated It

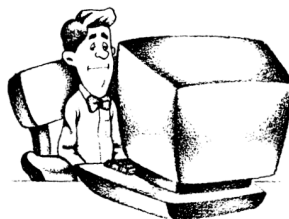
	Kids	Adults
Instructions	A	A-
Content	A	A
Technical Quality	C	A-

Comments:

Don't be fooled by the early reading level, or the fact that this program is aimed at fourth- to ninth-graders. *The Factory* is an intriguing puzzle that can fascinate parents as well as their children. In testing a machine, building a factory, and designing a product, users are asked to work backwards, analyze a process, determine a sequence, and throw in a little creativity. This appears to be a program with real staying power.

Touch Typing

by Atari, Inc.



Grade Level and Type

Recreational ☐

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☐

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☐

Paddle ☐

How They Rated It

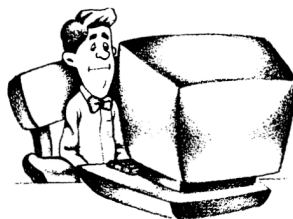
	Kids	Adults
Instructions	F	C
Content	C	C
Technical Quality	B	C

Comments:

Since a computer keyboard is the same as a typewriter keyboard, teaching yourself to type with the aid of your home computer is a natural. With *Touch Typing* you can learn typing even if you have never typed before, and can work up to advanced levels. The program keeps track of speed and errors for you. (SEE *MasterType*)

Tutti Frutti

by Adventure International



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☐

Elementary ☒

Requirements

Disk ☒ 32K

Cassette ☒ 16K

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

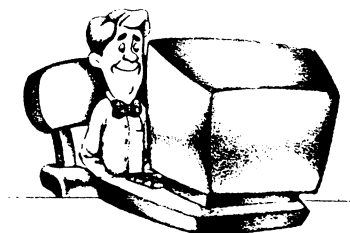
	Kids	Adults
Instructions	A	D
Content	A	D
Technical Quality	A	F

Comments:

A classic disagreement: adults found little of value to *Tutti Frutti*, seeing it as a *Pac-Man* ripoff; the kids enjoyed playing the game, several mentioning *Tutti Frutti* was enjoyable because it was “so much like *Pac-Man*.” Many children decided the only thing they didn’t like about the program was when they had to stop playing. Our favorite comments were from five-year-old Lisa. She most enjoyed “eating up the little guy.” She least enjoyed it when “the guy ate me up, too.”

Word Maker

by APX



Grade Level and Type

Recreational ☒

Preschool ☐

Educational ☒

Elementary ☒

Requirements

Disk ☒

Cassette ☒

Cartridge ☐

BASIC Cartridge ☒

Joystick ☒

Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	C
Content	A	C
Technical Quality	C	B

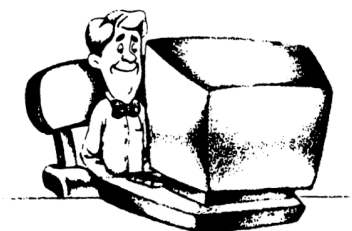
Comments:

Word Maker offers friendly and educational spelling competition. Although aimed at grades first through third, one teacher said she could use it “up to remedial high school level.” The game is easy to learn and can be played by one or two players. Several children and parents were frustrated by the difficulty in using the joystick. One teacher felt it didn’t exercise verbal ability “nearly as much as it exercised the ability to manipulate the joystick.” However, he went on to say *Wordmaker* was useful in helping kids to develop strategies, and “any time kids play with words and letters, it’s a good thing.”

The authors suggest it would be a better game if the letters were spread out, a speed index put in, and the dictionary of reference shown. The computer bought BOT as an acceptable word.

Word Scramble

by T.H.E.S.I.S.



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 24K Cassette ☒ 16K Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	D
Content	A	A-
Technical Quality	A	B

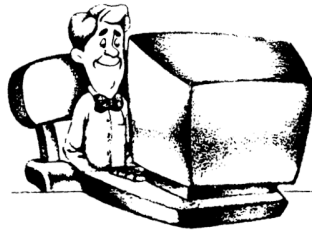
Comments:

Designed for first through third-graders, *Word Scramble* is a fun and interesting word game. A robot appears on the screen and shoots letters from a gun to form a scrambled word. Players try to unscramble the words. A scoreboard keeps track of number of tries and successful answers.

Although the program says new words can be entered, our adult play-testers were unable to do this. While complete, the documentation is difficult to read as the type is small and scrunched together. Overall, adults and kids enjoyed *Word Scramble*. As nine-year-old Carlos put it, "It's pretty hard, but it's sure fun."

Word Search Generator

by APX



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ Cassette ☐ Cartridge ☐
BASIC Cartridge ☒ Joystick ☒ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	B	C
Content	B	B
Technical Quality	B	C

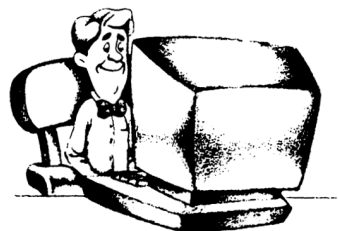
Comments:

Word Search Generator is similar to *Hidden Words*. In both games, the player is presented with a grid of letters, with words hidden up or down, left or right, or diagonally. *Word Search Generator* goes beyond *Hidden Words*, however, in allowing the player to modify the 15 column by 15 row grid offered. (Younger children may choose a grid as small as 8×8 .) Players have the option of reviewing the puzzle to see where those words were hiding.

Players may also choose a game format (one or two players) with the computer supplying the words, printer format (print searches and their solutions), or file builder (to create new word banks for word search grids). (SEE *Hidden Words*)

WordRace

by Don't Ask Computer
Software



Grade Level and Type

Recreational ☒ Preschool ☐
Educational ☒ Elementary ☒

Requirements

Disk ☒ 32K Cassette ☒ 16K Cartridge ☐
BASIC Cartridge ☒ Joystick ☐ Paddle ☐

How They Rated It

	Kids	Adults
Instructions	A	B
Content	A	B
Technical Quality	C	C

Comments:

WordRace will be enjoyed by those who already like words, and will benefit those who wish to work on their vocabularies. Players are given a word and must choose the best definition from six choices. One to four may play at a time. Wrong answers lose points, so it is best not to guess. There are two levels of play: beginners (ages nine to fourteen), and intermediates (ages eleven to sixteen).

Even players younger than nine enjoyed the challenge of *WordRace*. Our testers did find a couple of problems. The cassette version took about twelve minutes to load—too long when kids want a fun game. Also, on the tape version the 0 did not register. Children wanting to play a game with 20 words would type in 20, only to find they were playing a game with two words!

Aside from these minor problems, *WordRace* was educational and fun.

Too Late for Review

Either due to technical reasons, or because they arrived too late, our play-testers did not have an opportunity to review the following programs. We present them here for your information only, with no evaluation or comment.

Welcome USA

Cassette

Welcome USA is an educational program containing informative descriptions of each of the 50 states, by merely typing in the name of the state. A true-false quiz is included.

Mapware

APX

40K DISK

BASIC Cartridge

With *Mapware* you can generate a wide variety of world maps. The diskette contains approximately 9,000 pairs of geographic coordinates for the main land masses and islands on Earth. With them, you can draw high resolution maps on your video screen for games, tracking satellites, overlays of satellite weather maps, or learning geography or cartography.

Facts in Five

Avalon Hill Game Co.

48K Disk

The authors have played and enjoyed the original (noncomputer) *Avalon Hill* game of knowledge, also called *Facts In Five*. There are several rounds of play, and in each round players must name people or objects in several categories. According to directions, it appears this program is the same, with the computer merely acting as electronic scorekeeper.

Jumpman

Automated Simulations, Inc. (Epyx)

32K Disk Joystick

The enemy has infiltrated Jupiter's headquarters. You, as Jupiter Jumpman—the government's top secret weapon—are the only one who can defuse the bombs and restore the communication systems. You have the ability to scale ladders, ropes, girders, and mysterious mazes.

King Arthur's Heir

48K Disk Joystick BASIC Cartridge

Set in the mystical world of Camelot, the program asks you to prove yourself worthy to inherit the kingdom from Arthur. To do so, you must go

in quest of the Scroll of Truth, hidden by Merlin. You will encounter magic, treachery, and fearsome dragons as you play.

Let's Spell

Program Design, Inc. (PDI)

Cassette Tape

This is a series of four programs with voice accompaniment. The first three teach a second-grade spelling list of 30 words each. The fourth program is a test of the ninety words.

Bandits

Sirius Software

48K Joystick

An action game requiring you to obliterate an attacking force of "Bandits." You begin with five ships. Twenty-eight levels of play.

The Blade of Blackpoole

Sirius Software

Disk

The object is to recover a magic sword and return it to the altar from whence it was stolen. You must solve puzzles to achieve your goal. This game will take some time and thought to play.

Cyclod

Sirius Software

48K Disk Joystick Optional

In this game you are an eyeball with a single mission: smash snakes. But the snakes' mission is to kill eyeballs. You avenge and defend yourself by pushing bricks across the screen.

Snake Byte

Sirius Software

48K Disk Joystick

To become a "master slitherer," you (the snake), need to eat all the apples in the room and exit out the door.

Space Eggs

Sirius Software

48K Disk Joystick or Paddles

Here you guide your ships through space and destroy all space eggs and their deadly inhabitants. You crack them open, one by one, and blast away at the evil alien that pops out.

Turmoil

Sirius Software

Disk Joystick

You destroy aliens by zooming up and down the center aisle of the screen and blasting away, trying to avoid a collision. Nine levels of play.

Wayout

Sirius Software

Disk Joystick, Paddles Optional

With only a compass and mapmaker, your task is to find a way out of one of 26 mazes—all in 3D. Glasses and compass included.

Survival Math

Sunburst Communications

16k Disk

This is a set of four programs that simulate real situations, designed to help the user become actively involved in developing math skills. Each program (*Travel Agent Contest*, *Smart Shopper Marathon*, *Hot Dog Stand*, and *Foreman's Assistant*) utilize the computer's ability to randomly generate problems; thus, the problems are always new and challenging. Sunburst appears to be committed to producing quality products. Although *Survival Math* is designed to be used by teachers for junior high and high school students, we feel it could be an enjoyable program for the family who wishes to put a school in its home.

FUTURE HALL OF FAMERS?

The following programs were not published at the time this manuscript was completed, but they should be available for the home by the time *Buy a School for Your Home* is published. Watch for them.

Atarilab Science Series

Atari, Inc.

We weren't able to see this one, but from advance reports, it sounds like a winner.

The Science Series is designed for students from fourth to twelfth grades. Programs will allow students to collect, analyze and display scientific data at home.

AtariLab is a modular series with an array of fascinating modules to choose from. With *Biofeedback*, you can train yourself to relax while the computer measures your temperature, skin moisture, and pulse rate. With *Timekeeper*, the ATARI becomes a stop watch, a lap timer, and a repeating timer. You can even use the computer as a lie detector. More coming.

We've come a long way from the Gilbert Chemistry Sets!

Tele-Chess (Knights Gambit)

Centurion Software

A unique two-player chess game. This program can be played by youngsters across the street or across the country. All they need is a telephone and a modem (see Chapter 3 for a discussion of modems). What is interesting about Tele-Chess, is that only one machine need be an ATARI.

D-Bug® Lost Lion® Word Flyer®

ChildWare

Creators of educational software for children, ChildWare's slogan is "Learning is the Ultimate Game." Although not complete at the time *Buy a School for Your Home* was written, the authors were able to preview, in rough form, three new programs that will be distributed by Electronic Arts.

D-Bug is a game within a game (think of *Tron*), designed to teach computer literacy. *Lost Lion*: Young children will want to play this game because it is so much fun. They won't realize they are actually learning sophisticated mathematical concepts. *Word Flyer* is another "fun" game. This program is designed to develop early reading skills.

These programs are notable for their compassion toward kids. They are designed to be cooperative, rather than competitive; all have good built-in reward systems. Compared to many programs now on the market, the difference is as a comic book to a fine novel. We believe these programs from ChildWare represent the next generation in software.

Part III

Appendices

APPENDIX A—Software Manufacturers

Acorn Software
634 North Carolina SE
Washington DC
20003

Adventure International
P.O. Box 3435
Longwood, FL
32750

Activision, Inc.
3255-2 Scott Blvd.
Santa Clara, CA
95051

Analog Software
P.O. Box 23
Worcester, MA
01653

Advanced Computing
Enterprises
5516 Rosechild
Shawnee, KS
66216

Apogee Software
9615 Farralone Ave.
Chatsworth, CA
91311

APX (See Atari Program
Exchange)

Artsci Inc.
10432 Burbank Blvd.
North Hollywood, CA
91601

Artworx
150 North Main Street
Fairport, NY
14450

Atari, Inc.
P.O. Box 61657
Sunnyvale, CA
94086

Atari Program Exchange
(APX)
P.O. Box 427
Sunnyvale, CA
94086

Auatar Software
2096-A Walsh Ave.
Santa Clara, CA
95050

Automated Simulations, Inc.
EPYX, Inc.
1043 Kiel Court
Sunnyvale, CA
94806

Avalon Hill Game Co.
4517 Harford Road
Baltimore, MD
21214

Bank, Inc.
4 Elm Street
Braintree, MA
02167

Big Five Software
P.O. Box 9078-185
Van Nuys, CA
91409

Bit Bucket
168 North Becon Rd.
Newton Highlands, MA
02161

Broderbund Software, Inc.
1983 Fourth Street
San Rafael, CA
94901

Budge Co.
428 Pala Ave.
Piedmont, CA
94611

Centurion Software
1714 Marshall Ave., Suite B
Los Altos, CA
94022

CE Software
238 Exchange St.
Chicopee, MA
01013

Creative Software
201 San Antonio Circle #270
Mountain View, CA
94040

ChildWare
P.O. Box 2348
Menlo Park, CA
94025

Computer Using Educators
(CUE)
Softswap
See Appendix G, "Public
Domain Software"

Code Works
Box 550
Goleta, CA
93116

Datasoft
19519 Business Center Dr.
Northridge, CA
91324

Computari
9607 Arthlone
Dallas, TX
75218

Don't Ask Computer Software
2265 Westwood Blvd. B150
Los Angeles, CA
90064

Computer's Voice
2370 Ella
Flint, MI
48504

Dorsett Educational
Systems Inc.
P.O. Box 1226 Goldsby
Airport
Norman, OK
73070

Continental Adventures
4975 Brookdale St.
Bloomfield Hills, MI
48013

Continental Software
11223 S. Hindry Ave.
Los Angeles, CA
90045

Dynacomp Inc.
1427 Monroe Ave.
Rochester, NY
14618

Eastern House
3239 Linda Dr.
Winston-Salem, NC
27106

EDU-Soft
4639 Spruce Street
Philadelphia, PA. 19139

Edu-Ware Services Inc.
P.O. Box 22222
Agoura, CA
91301

Educational Software
P.O. Box 746
McMinnville, OR
97128

Educational Software, Inc.
4565 Cherryvale
Soquel, CA
95073

Edufun
1100 Research Blvd.
St. Louis, MO
63132

Electronic Arts
2755 Campus Dr.
San Mateo, CA
94403

English Software Co.
P.O. Box 3185
Redondo Beach, CA
90277

EPYX (See Automated Simu-
lations)

G.A.M.E.S.
6626 Valjian Street
Van Nuys, CA
91406

Gamma Software
P.O. Box 25625
Los Angeles, CA
90025

Hayden
600 Suffolk
Lowell, MA
01853

Human Engineered Software
(HES)
150 N. Hill
Brisbane, CA
94005

Illusions II
P.O. Box 16489
Irvine, CA
92713

Image Computer Prod., Inc.
615 Academy Dr.
Northbrook, IL
60062

Imagic
981 University Ave.
Los Gatos, CA
95030

Lightning Software
P.O. Box 11725
Palo Alto, CA
94306

In-Home Software
2485 Dunwin Drive #1
Missisanga, Ontario LRL 1T1
Canada

LJK Enterprises Inc.
P.O. Box 10827
St. Louis, MO
63129

Innovative Software, Inc.
(ISDI)
920 First National Bank
Tower
Las Cruces, NM
88001

Manhattan Software
P.O. Box 1063
Woodland Hills, CA
91365

Milliken Publishing Co.
110 Research Blvd.
St. Louis, MO
63132

JV Software
3090 Mark Ave.
Santa Clara, CA
95051

Milwaukee Software
P.O. Box 94
Butler, WI
53007

Kinetic Designs
401 Monument Rd. #123
Jacksonville, FL
32211

Muttontown Software
RFD 1876 Muttontown Rd.
Syosset, NY
11791

Learning Company, The
545 Middlefield Road #170
Menlo Park, CA
94025

NCD
P.O. Box 947
Solana Beach, CA
92075

On Line
10944 N. May Ave.
Oklahoma City, OK
73120

Reston Publishing Co., Inc.
11480 Sunset Hills Road
Reston, VA
22090

Opportunities For Learning
8950 Lurline Ave.
Dept. 2DFC
Chatsworth, CA
91311

Santa Cruz Educational
Software
5425 Jugger Dr.
Soquel, CA
95073

Optimized Systems Software,
Inc.
10379 Lansdale Ave.
Cupertino, CA
95014

Scarborough Systems, Inc.
25 North Broadway
Tarrytown, NY 10591

Phoenix Software, Inc.
64 Lake Zurich Dr.
Lake Zurich, IL
60047

Sebree's Computing
456 Granite Ave
Monrovia, CA
91016

Portronics
17537 Chatsworth
Granada Hills, CA
91344

Sentient Software, Inc.
P.O. Box 4929
Aspen, CO
81612

Powersoft
P.O. Box 157
Pitman, NJ
08071

Sierra On-Line, Inc.
36575 Mudge Ranch Rd.
Coarsegold, CA
93614

Program Design, Inc. (PDI)
11 Idar Court
Greenwich, CT 06830

Quality Software
6660 Reseda, Suite 105
Reseda, CA
91330

Sirius Software
10364 Rockinham Dr.
Sacramento, CA
95827

Spectrum Computers
26618 Southfield
Lathrup Village, MI
48076

Synapse Software
5327 Jacuzzi Street
Richmond, CA
94804

Spinnaker Software
215 First Street
Cambridge, MA
02142

Synergistic Software
830 North Riverside Dr.
#201
Renton, WA
98055

SRA
155 North Wacker Dr.
Chicago, IL
60606

T.H.E.S.I.S.
P.O. Box 147
Garden City, MI
48135

Strategic Simulations, Inc.
465 Fairchild Dr. Suite 108
Mountain View, CA
94043

TLC (See Learning Company,
The)

Sublogic Communication
Corp.
713 Edgebrook Dr.
Champaign, IL
61820

United Software of America
750 3rd Ave.
New York, NY
10017

Sunburst Communications
39 Washington Ave.
Pleasantville, NY
10570

University Software
P.O. Box 4544
Stanford, CA
94305

Swiftly Software, Inc.
64 Broad Hollow Rd.
Melville, NY
11747

Valpar International
3801 E. 34th Street
Tucson, AZ
85713

Versa Computing Inc.
3541 Old Conejo Rd.
Suite 104
Newbury Park, CA
91320

Zapata Microsystems
P.O. Box 401483
Garland, TX
75040

West Coast Software
4645 Sauk Ave.
San Diego, CA
92117

APPENDIX B— Publications

Selected Books

Albrecht, Bob, et. al. *Atari Basic*. Wiley, 1979.

Carris, William. *Conversational BASIC for the Atari*. Reston Publishing Co., Inc., 1982.

Compute's First Book of Atari. Compute Books, 1982.

Hirshfeld, Tom. *How to Master Video Games*. Bantam, 1981.

Kohl, Herb, et. al. *Atari Games and Recreations*. Reston Publishing Co., Inc., 1982.

Lathrop, Ann, and Bobbie Goodson. *Courseware for the Classroom*. Addison-Wesley, 1983.

Moore, Herb, et. al. *Atari Sound and Graphics*. Wiley, 1982.

North, Alan. *101 Atari Programming Tips and Tricks*. ARCsoft, 1982.

North, Alan. *31 New Atari Computer Programs for the Home, School and Office*. ARCsoft, 1982.

Thornburg, David. *Picture This!* Addison-Wesley, 1982.

Willis, Jerry, and Merle Miller. *Computers for Everybody*. dilithium Press, 1982.

Selected Periodicals

A.N.A.L.O.G., Atari, Inc, 565 Main Street, Cherry Valley, MA 01611.

**Antic*: 600-18th Street, San Francisco, CA 94107

**Atari Connection*, 1265 Borregas, P.O. Box 427, Sunnyvale, CA 94086

BYTE, 70 Main Street, Peterborough, NH 03458

Compute!, P.O. Box 5406, Greensboro, North Carolina 24703

Creative Computing, 79 East Hanover St., Morris Plains, NJ 07950

** *Digit*, P.O. Box 29996, San Francisco, CA 94129

Family Computing, 730 Broadway, New York, NY 10003

InfoWorld, 530 Lytton Ave., Palo Alto, CA 94306

Microcomputing, 80 Pine Street, Peterborough, NH 03458

Personal Computing, P.O. Box 13916, Philadelphia, PA 19101

* Devoted entirely to the ATARI computer. The others are general interest computer publications that will include Atari.

** Written for the young computer user.

Popular Computing, 70 Main Street, Peterborough, NH 03458

Purser's Magazine, P.O. Box 466, El Dorado, CA 95623

SoftSide, 6 South Street, Milford, NH 03055

APPENDIX C— Atari, Inc. Users' Groups

The following is only a partial list of Atari users' groups. There are many smaller groups throughout the country, and a good number overseas also.

To determine if there is a user group closer to you, call Atari's Customer Service: (800) 538-8543. If you live in California, call (800) 672-1404.

ALABAMA

HUNTSVILLE ATARI (COMPUTER) USERS' GROUP

Harold R. Blevins, President
514 Jeffrey Drive N.W.
Huntsville, AL 35806
205 837-2437 (H)
205 453-3809 (W)

LITTLE ROCK ATARI (COMPUTER) ADDICTS

Keith A. Steensma, President
Building 7—Apt. 139
3900 McCain Park Drive
North Little Rock,
AR 72116
501 753-2499 (H)

CALIFORNIA

ARIZONA

COMPUTER WIZARDS

Frank Barajas, President
530 S. Dobson Road #359
Mesa, AZ 85202
602 966-4275 (W)
602 969-9502 (H)

REDWOOD ATARI GROUP

Leonard Harrison, President
8498 Linden Avenue
Cotati, CA 94928
707 525-1400 X2406 (W)
707 795-5806 (H)

ARKANSAS

FT. SMITH ATARI USERS' GROUP

Ernest Serrano, President
2672 S. Enid Street
Ft. Smith, AR 72901
501 646-4557 (H)
501 646-0197 (BBS)

ATARI KIDS OF CLARE- MONT

Dennis Wong, Librarian
23602 Decorah Road
Diamond Bar, CA 91765
714 595-9730 (H)

**ATARI BAY AREA
COMPUTER USERS'
SOCIETY**

Dave Mentley, President
P.O. Box 325
El Cerrito, CA 94530

**LOS ANGELES
ATARI COMPUTER
ENTHUSIASTS**

Bob Keimach, President
15760 Ventura #900
Encino, CA 91436
213 986-8366 (W)
213 986-0687 (H)
213 783-8373 (BBS)

**ATARI COMPUTER
ASSOCIATION OF
ORANGE COUNTY**

Tom Mannos, President
P.O. BOX 9149
Fountain Valley,
CA 92708
714 770-0372 (W & H)

**GOLETA/SANTA BAR-
BARA ATARI USERS'
GROUP**

Ken Smith, President
365 Hillsboro Way
Goleta, CA 93117
805 968-4044 (H)
805 687-6405 (W)

**SAN DIEGO
ATARI COMPUTER
ENTHUSIASTS**

Dick Hiatt, President
5353 Baltimore Drive #39
La Mesa, CA 92041
619 277-6700 X218 (W)
619 463-8460 (H)

**BAY AREA ATARI
USERS' GROUP**

Ron Sivertson
705 Casa Bonita Court
Los Altos, CA 94022
408 746-6971 (W)
415 948-0366 (H)
Gene McCreary, President

**SOUTH BAY ATARI
COMPUTER
ENTHUSIASTS**

James Jengo, Secretary
5025 Range Horse Lane
Rolling Hills Estates
CA 90274
213 437-2801 (W)
213 378-5523 (H)

**ATARI COMPUTER
CLUB ENCOMPASSING
SUBURBAN SACRA-
MENTO (ACCESS)**

Richard Dean, President
P.O. 1354
Sacramento, CA 95806
916 454-1071 (H)
916 363-3304 (BBS)

**S.L.O. POKES ATARI
COMPUTER USERS'
GROUP**

Charles Stancarone, President

P.O. Box 4156
San Luis Obispo,
CA 93406
805 528-4758 (H)

**SANTA BARBARA
ATARI COMPUTER
ENTHUSIASTS**

Chuck Brantingham, President

204 W. Cannon Perdido
Santa Barbara, CA 93101
805 684-1816 (H)

**LOMPOC/SANTA
MARIA ATARI COM-
PUTER USERS' GROUP**

Jim Wooding, President
398 Highland Drive
Santa Maria, CA 93455
805 928-2671 (W)
805 937-6193 (H)

**WEST LOS ANGELES
ATARI USERS' GROUP**

Steven Dayan, President
1417 14th Street #9
Santa Monica, CA 90404
213 557-6966 (W)
213 451-5221 (H)

COLORADO

**STARFLEET ATARI
COMPUTER USERS'
GROUP**

Robert Gordon, President
6191 South Forest Court
Littleton, CO 80121
303 773-0563 (H)
303 399-8020 X476 (W)
303 758-6233 (BBS)

CONNECTICUT

**ATARI USERS OF
SOUTHERN CONNEC-
TICUT**

David Liebreich, Vice President
112 Hawthorne Drive
Fairfield, CT 06432
203 372-8932 (H)

FLORIDA

**TAMPA BAY AREA
ATARI COMPUTER
USERS' GROUP**

Randal C. Gibson, President
812 W. River Drive
Tampa, FL 33617
813 988-4503

**ATARI BOOSTERS
LEAGUE EAST**

Hadley Nelson, President
P.O. Box 1172
Winter Park, FL 32790
305 671-0317 (H)

GEORGIA

CONTACT

Haynes McFadden, President
1046 Northside Drive, N.W.
Atlanta, GA 30318
404 872-9458 (W)
404 992-9992 (H)

IDAHO

BOISE USERS' GROUP

James F. Adams
2105 Bergeson Street
Boise, ID 83706
208 342-7563 (H)
208 343-8075 (W)

ILLINOIS

BASE

Jim Knight, President
6 Carraway Court
Bloomington, IL 61701
309 662-4311 X665 (W)
309 663-5971 (H)

SUBURBAN CHICAGO ATARIANS (SCAT)

Ray Hendrickson, President
12611 S. Ada
Calumet Park, IL 60643
312 597-2792 (H)
312 620-6441 (BBS)

SEARLE ATARI COM- PUTER USERS' GROUP (Restricted to G.D. Searle Employees)

Jerome A. Funk, President
G.D. Searle & Co.
Box 5110
Chicago, IL 60680

MCDONOUGH COUNTY ATARI USERS' GROUP

Mary Kubasak, Secretary
604 W. Carroll
Macomb, IL 61455
309 833-3886 (W)
309 837-3649 (W)

PEORIA ATARI COM- PUTER ENTHUSIASTS

Larry Stagen, President
205 S. Shore Drive
Morton, IL 61550
309 444-3167 (W)
309 263-1123 (H)

LINCOLNLAND ATARI GROUP

Randall R. von Liski, President
2620 Lemont Drive
Springfield, IL 62704
217 782-0244 (W)
217 787-8041 (H)

AURA

Bob Cobb, President
P.O. Box 156
Wood River, IL 62095
618 463-1333 (W)
618 254-4065 (H)
314 894-9243 (BBS)

IOWA

HAWKATARI

John K. Wiese, Secretary
2565 22nd Avenue
Marion, IA 52302
319 377-8722 (H)

KANSAS

KANSAS CITY ATARI COMPUTER ENTHUSIASTS

Ken Warner, President
12905 W. 101st Street
Lenexa, KS 66215
913 888-4000 (W)
913 888-5200 (H)

LOUISIANA

BATON ROUGE ATARI (COMPUTER) GROUP

Bob Loudon, President
Computer Electronics
1955 Dallas Drive
Baton Rouge, LA 70806
504 359-4282 (W)
504 926-7710 (H)
504 273-3116 (BBS)

THE NEW ORLEANS ATARI COMPUTER USERS' GROUP

Paul Strauss, President
8223 Plum Street
New Orleans, LA 70118
504 865-5145 (W)
504 861-8772 (H)

MARYLAND

ARINC MICROCOM- PUTER CLUB

Bruce Morgenstern, President
2551 Riva Road
Annapolis, MD 21401
301 266-4735 (W)
301 267-9106 (H)

APL ATARI USERS' GROUP

Lynna Babs Spornick, President
Applied Physics Labs.
Johns Hopkins Road, 8-136
Laurel, MD 20707
301 953-7100 X3425 (W)
301 596-3340 (H)

MICHIGAN

CAPITOL HILL ATARI OWNERS SOCIETY

Will M. Hudson Jr., President
P.O. Box 16132
Lansing, MI 48901
517 351-3092 (H)

MINNESOTA

TWIN CITY ATARI IN- TEREST GROUP

Peter Asch, President
4145 Harriet Avenue S.
Minneapolis, MN 55409
612 825-1242 (H)

NEVADA

SOUTHERN NEVADA
ATARI COMPUTER
CLUB (SNACC)
Richard Rowland, Secretary
7408 Walnut Creek
Las Vegas, NV 89117
702 739-7488 (W)
702 876-9231 (H)
Don Messenger, President

NEW HAMPSHIRE

NEW HAMPSHIRE
ATARI COMPUTER
CLUB
Paul Johnson, President
P.O. Box 5288
Manchester, NH 03108

NEW JERSEY

JERSEY ATARI COM-
PUTER GROUP
Richard Kushner, President
58 Dewey Avenue
High Bridge, NJ 08829
201 582-4794 (W)
201 638-8732 (H)
201 377-4084 (BBS)

NEW YORK

ATARI STAR USERS'
GROUP
Richard S. Abramson, Presi-
dent
915 Oak Lane
North Woodmere,
NY 11581
212 486-5870 (W)
212 791-1156 (H)

CAPITAL DISTRICT
ATARI COMPUTER
ENTHUSIASTS
Richard Paniccia, President
2279 Nelson Drive
Schenectady, NY 12309
518 382-3330 (W)
518 346-5542 (H)

NORTH CAROLINA

ATARI COMPUTER
USERS' SOCIETY OF
FAYETTEVILLE
Sam Carter, President
P.O. Box 1117
Fayetteville, NC 28302
919 483-2222 (W)
919 485-5180 (H)

PIEDMONT TRIAD
ATARI USERS' GROUP
Francine A. Strayhorn, Trea-
surer
6104 Knight Road
Greensboro, NC 27410
919 294-6920 (H)

OHIO

**ATARI COMPUTER
ENTHUSIASTS OF
CLEVELAND**
Bruce Frumker, President
Cleveland Museum of Natural History
Wade Oval—University Circle
Cleveland, OH 44106
216 231-4600 (W)
216 321-6749 (H)

OKLAHOMA

***ATARI COMPUTER
CLUB OF OKLAHOMA
CITY, INC.**
Andee White, President
P.O. Box 32672
Oklahoma City, OK 73123
405 789-9393 (H)
405 271-2226 (W)

OREGON

**ATARI COMPUTER
ENTHUSIASTS OF
EUGENE**
Mike Dunn, Editor
3662 Vine Maple Drive
Eugene, OR 97405
503 344-6193 (H)
503 687-6061 (W)
503 343-4352 Bulletin Board
Kirt Stockwell, President

PORTLAND ATARI CLUB

Joe Engel, President
4035 N. Vancouver Avenue
Portland, OR 97227
503 222-6300 (W)
503 282-0881 (H)
503 245-9405 (BBS)

PENNSYLVANIA

**BETTIS ATARI USER
DEVOTEES**
Barry Z. Hyatt, President
3448 Forest Road
Bethel Park, PA 15102
412 462-5000 X6102 (W)
412 833-0018 (H)

ABE'S ACES
Joseph W. Mendeola, President
Green Acres, Lot 2-8
Breinigsville, PA 18031
215 743-4100 X239 (W)
215 395-3897 (H)

SOUTHCENTRAL PENNSYLVANIA ATARI COMPUTER ENTHUSIASTS

John A. Levin, President
330 Yew Place
Harrisburg, PA 17104

***PHILADELPHIA AREA
COMPUTER SOCIETY—
ATARI COMPUTER
USERS' GROUP**

Dennis J. Harkins
2349 E. Vine Street
Hatfield, PA 19440
215 368-5177 (H)
215 628-2650 (W)
215 836-5116 (BBS 5 PM–8 AM)
Bill Richardson, President

**PITTSBURGH ATARI
COMPUTER ENTHUSI-
ASTS**

Ron Quinlan, President
466 Rosewood Drive
Pittsburgh, PA 15236
412 655-3046 (W & H)
412 655-2652 (BBS)

COMPUSTARS

John D. Hoffman, President
888 N. Hanover Street
Pottstown, PA 19464
215 755-4519 (W)
215 327-3467 (H)

**BERKS/READING AREA
COMPUTER ENTHUSI-
ASTS (BRACE)**

Paul Adams
Box 218A, RD 4
Reading, PA 19606
215 929-2637 (H)
215 929-7213 (W)

RHODE ISLAND

**FIRST ATARI CLUB OF
RHODE ISLAND**

Tony Messina, President
48 Dudley Avenue
Newport, RI 02840
401 847-7260 (W)
401 847-2476 (H)

TEXAS

**ATARI COMPUTER
USERS' GROUP OF
DALLAS**

Gary Sewell, President
625 Valley View
Allen, TX 75002
214 727-6567 (H)

**AUSTIN ATARI COM-
PUTER ENTHUSIASTS**

David Mann, President
7108 Spurlock Drive
Austin, TX 78731
512 346-4940 (H)
512 250-3540 (W)

**CORPUS CHRISTI COM-
PUTER CLUB**

Jim Watson, President
801 Orleans Drive
Corpus Christi, TX 78418
512 888-3162 (W)
512 937-5607 (H)

HOUSTON ATARI COMPUTER ENTHUSIASTS (HACE)

William Frank, President
5310 Jackwood Street
Houston, TX 77096
713 658-4358 (W)
713 661-1743 (H)

ALAMO AREA ATARI COMPUTER USERS' ASSOCIATION

Rob E. Warren
3646-B Fredricksburg Road
San Antonio, TX 78201
512 735-5440 (W)
Dr. P. R. Serafine, President

UTAH

ATARI COMPUTER ENTHUSIASTS OF SALT LAKE

Susan Pope, Secretary
5522 Sarah Jane Drive
Kearns, UT 84118
801 967-1037 (H)
Stephen Lewis, President

VIRGINIA

G.R.A.S.P.
Richard E. DeVore, President
8720 Courthouse Road
Chesterfield, VA 23832
804 748-3031 (H)

PENINSULA ATARI COMPUTER ENTHUSIASTS OF VIRGINIA

Dr. Olaf Storaasli, President
109 Five Forks Lane
Hampton, VA 23669
804 827-3401 (W)
804 851-4936 (H)
804 898-7493 (BBS)

NOVATARI

Tom Bartelt, President
c/o Warner Amex Cable of
Reston
P.O. Box 2400
Reston, VA 22090
703 471-1924 (W)
703 476-8385 (H)

THE SOUTHSIDE TIDEWATER ATARI TECHNICAL USERS' SOCIETY

Gene Rodriguez, President
4836 Honeygrove Road
Virginia Beach, VA 23455
804 499-6021 (H)

WASHINGTON

SEATTLE PUGET SOUND ATARI COMPUTER ENTHUSIASTS

Thomas E. Newman, President
2206 Aqua Vista Court NW
Gig Harbor, WA 98335
206 967-5910 (W)
206 958-7649 (H)

WISCONSIN

PACKERLAND ATARI COMPUTER SOCIETY

Barry Dawes, President
815 Gregory Pl.
Green Bay, WI 54303
414 434-0665 (H)

MILATARI

Gary Nolan, President
11230 W. Bobolink Avenue
Milwaukee, WI 53225
414 464-1200 (W)
414 353-9716 (H)

WYOMING

COMPUTERS ANONY- MOUS

Ron Long
c/o The Micro Center
#1 Southview Center
Gillette, WY 82716
307 686-0006 (W)
Bob Flory, President

International

AUSTRALIA

ATARI COMPUTER
ENTHUSIASTS (N.S.W.)
Tony Reeve, President
G.P.O. Box 4514
Sydney, N.S.W. 2001
Australia
923 9586 (W)
452 2974 (H)

CANADA

LONDON ATARI COM-
PUTER USERS' GROUP
Bill Rumball, President
38 Southview Place
London, Ontario
Canada N6J 1S2
519 472-5439 (H)

TORONTO ATARI
FEDERATION
Frank Leaver, President
71 Robert Hicks Drive
Willowdale, Ontario
Canada M2R 3R2

HOLLAND

ATARI USERS' CLUB OF
HOLLAND
Paul Veger, President
Strawinskylaan 26
2102 CP Heemstede
Holland
023-280350. 10:00-15:00 (W)
023-288003 (H)

MEXICO

ATARI COMPUTER
USERS' GROUP OF
MEXICO CITY
Alex Olegnowicz, President
Apartado postal 105-160
Mexico D.F. 11560
531-39-18

APPENDIX D—Joysticks

The following is a list of some of the more popular models of joysticks and trackball controllers, with a short description of their features. It is meant to provide reference, rather than recommendation or endorsement.

Atari Joystick

Atari, Inc.
1196 Borregas Avenue
Sunnyvale, California 94086
Approximate Price: \$10.00

The Atari joystick is a standard two-handed instrument. Leverage may be increased by placing the end of the stick on to a PVC plastic “T” connector (available at hardware stores). The Atari joystick includes a 4-foot cord.

Baylis Big Stick

Torrey Enberg Smith Co.
P.O. Box 1075
Glendale, California 91209
Approximate Price: \$60.00

The actual stick is only 2½-inches high, including the large red ball on the tip. It is the base that is big—nearly 8-inches square. The Baylis is designed to be rested on a tabletop or lap and operated with one hand. The stick is a rigid steel shaft built to arcade standards. The fire button is also large (arcade style). The cord is 2½-feet long.

Command Control Trackball

WICO Consumer Division
6400 W. Gross Point Road
Niles, Illinois 60648
Approximate Price: \$70.00

This trackball has a heavy billiard-style ball rotating in its casing that gives it a coasting spin. This is due to the steel shafts with ball bearings. The trackball's weight and rubber footpads keep it from slipping on tabletops and the fire buttons are the same as those on WICO's joysticks. The cord is 5-feet long and extra heavy-duty.

Fingertip Controller

KY Enterprises
3039 East Second Avenue
Long Beach, California 90803
Approximate Price: \$30.00

This controller is a heavy metal box with five large, springy, arcade-style buttons. The buttons are unlabeled, but the white ones correspond to up, down, left, and right, while the red one is the fire button. Also, this controller is left-handed. That is, your right hand controls the rotational movement while your left hand hits the fire button—just the opposite of the arcades. The Fingertip Controller has a 5½-foot cord.

Kraft Joystick

Kraft Systems, Inc.
450 W. California Avenue
Vista, CA 92083
Approximate Price: \$65.00

The Kraft joystick for the Atari is a smaller design when compared to the larger "baseball bat"-style handle. The firing buttons on the base of the joystick are flat. The patented internal design includes an eight-direction response. The Kraft joystick comes with an 8-foot cord and a one-year warranty. Kraft also makes a joystick for left- and right-handed players, with fire buttons on both sides, called the Kraft Switch-Hitter.

Le Stick

Datasoft, Inc.
19519 Business Center Drive
Northridge, California 91324
Approximate Price: \$40.00

Le Stick consists only of a joystick—no base. Constructed of a pliant, rubber-like plastic, the handle incorporates four memory switches that are activated by tilting. Tilting the handle forward causes the screen to move up, tilting it backward causes movement downward, and so forth. Without a mechanical connection to a base, flexibility is unlimited; there is no joint to wear out, making true one-handed operation possible. Le Stick has a 4-foot cord.

Pointmaster

Discwasher, Inc.
1407 N. Providence Road
Columbia, Missouri 65201
Approximate Price: \$17.00

The Pointmaster consists of a long plastic handle with a molded grip attached with a ball joint to a plastic base. The stick is flexible but no contact spots are obvious. The fire button, mounted on the tip of the handle, is contoured. The cord is 5-feet long, reinforced with a collar at the base end.

The Power Stick

Amiga
3350 Scott Blvd.
Building #7
Santa Clara, CA 95051
Approximate Price: \$10.00

The Power Stick lever-arm reduces potential for stress on the internal mechanism. The industrial strength plastic casing helps to increase overall reliability. The lever-arm is precision designed to fit in the hand with fire buttons located on each side to accommodate both left- and right-handed players. The Power Stick comes with a 6-foot cord and its own plastic carrying case.

Quick Shot

Spectravision
39 W. 37th Street
New York, New York 10018
Approximate Price: \$15.00

Quick Shot has four standard rubber pads on the base, that can be removed and replaced with suction cups, thus enabling it to be firmly anchored to a tabletop for one-handed use. The Quick Shot is constructed of plastic, with two fire buttons, one on the stick, the other on the base. The Quick Shot includes a 4-foot cord strengthened at the base end.

Slik Stik

Suncom, Inc.
270 Holbrook Drive
Wheeling, Illinois 60090
Approximate Price: \$10.00

The Slik Stik is about half the height of Atari's and is topped by a jaw-breaker-sized red ball for easy handling. This joystick is manufactured as a direct replacement for the Atari joystick. The Slik Stik has a 6-foot cord reinforced at both ends with plastic collars where the cord joins the joystick base and plug. It comes with a 90-day guarantee.

Starfighter

Suncom, Inc.
270 Holbrook Drive
Wheeling, Illinois 60090
Approximate Price: \$17.00

Starfighter is very similar to the company's Slik Stik but is of a more rugged construction and is guaranteed for two years. The Starfighter has a smooth plastic cylinder with a rounded top. There are definite stops to the stick's movements so it cannot be damaged by over-twisting. The joystick has a 6-foot cord with reinforced connections.

Starplex Video Game Controller

Starplex Electronics, Inc.
E23301
Liberty Lake, Washington 99019
Approximate Price: \$30.00

This controller is intended largely for one game—*Asteroids*. The button layout is designed to simulate the controls on the arcade version. There are buttons labeled “left,” “right,” “up,” “down” (hyperspace), and “fire.” It features “Astroblast”—an option with a slide switch that allows automatic repeat fire when the fire button is held down. This feature requires an AA battery to be installed inside the controller.

TG Trackball

TG Products
1104 Summit Avenue
Suite 110
Plano, Texas 75074
Approximate Price: \$65.00

The TG Trackball works much like the WICO trackball, using LED's and phototransistors to detect the ball's spin. This version has less tendency to coast. Inside, the trackball supports a “billiard ball” on plastic shafts without ball bearings. Lubrication is suggested on the shafts to reduce excessive wear. The trackball's extra-heavy cord is just short of 5 feet and is reinforced at both ends.

WICO Command Control

WICO Consumer Division
6400 W. Gross Point Road
Niles, Illinois 60648
Approximate Prices:
Command Control: \$30.00
Red Ball: \$35.00
Command Control
Deluxe: \$40.00

This joystick is ruggedly built to arcade standards, with a steel shaft inside the plastic stick and metal parts at critical points. The Command Control has a long “baseball-bat” handle. There is a small fire button on the tip of the stick and a larger one in the usual position on the base. A slide switch on the base selects between the two. The cord is 5½-feet long, strengthened with a plastic collar at the base.

APPENDIX E—Computer Networks

Here is a brief (by necessity) list of timesharing and/or data base companies and their telephone numbers:

Compuserve	800 848-8990
Dialog Information Service	800 528-6050
Dow Jones	800 257-5114
Knowledge Index	800 858-3796
Telenet	800 336-0437
Timenet	800 336-0149
Westlaw	612 228-2500

Directory of Online Databases

Cuadra Associates

2001 Wilshire Blvd., Suite 305

Santa Monica, CA 90403

The above is a comprehensive directory of database services. The over-1600 entries include money market services, toxicology, restaurant guides, social services, barter services, consumer surveys, currency exchange rates, and wine libraries, just as a sample.



APPENDIX F—Computer Camps

Summer camps have changed considerably in the past few years. The following is a partial list of those camps using ATARI computers. New ones open all the time.

We are not necessarily endorsing any of these camps. We suggest parents interested in sending their children to computer camps use this list as a starting point. As in selecting *any* school or recreational facility for children, a thorough investigation is always required.

NAME	LOCATION
ATARI COMPUTER CAMPS	
40 E. 34th Street New York, NY 10016 (800) 847-4180 In New York and Canada call collect: (212) 889-5200	(7 camps nationwide)
COLOR COUNTRY COMPUTER CAMP	
c/o Dixie College 225 S. 700 East St. George, UT 84770 (801) 673-4811	(2 Utah locations)
COMPU CAMPS	
4810 W. 78th Street Minneapolis, MN 55435 (800) 328-4815 ext. 549 In Minnesota, call (800) 752-4249	(9 locations nationwide)
COMPUTER FEST	
433 N. Murray Street Madison, WI 53706 (608) 263-6987	(University of Wisconsin)

**DATA BASE COMPUTER
CAMP**

6454 Valley View Road
Oakland, CA 94611
(415) 339-2961
(415) 856-1292

(Calistoga)

**FAMILY COMPUTER
CAMP**

Clarkson College
Potsdam, NY 13676
(315) 268-6647

(upstate NY)

TIMBER TECH

1287 Lawrence Station Road
Sunnyvale, CA 94086
(408) 745-1110

(Scott's Valley)

Appendix G

Public Domain Software

EDSEL
c/o Stanford Avenue School
2833 Illinois Avenue
South Gate, CA 90281

HOME Computer Library
Dept. B
1469 Rosena Avenue
Madison, OH 44057

Libraries Unlimited, Inc.
P.O. Box 263
Littleton, CO 80160

Microcomputer Software Exchange
c/o Steven L. Snover
Department of Mathematics and Computer Science
University of Hartford
West Hartford, CT 06117

C.U.E. Softswap Library
San Mateo County Office of Education
333 Main Street
Redwood City, CA 94063

Young People's Logo Association
1280 Hillsdale
Richardson, TX 75081

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Buy a School for Your Home

Judy Lower, with Ed Neil and Tim Finger

The home computer is a powerful tool that encourages children to learn and explore while they play. **BUY A SCHOOL FOR YOUR HOME** is designed to help you enhance the education of children at home by using this unique capability of the computer. You'll find out how to select hardware and software; you'll see what role arcade-type games and adventure games can play in the learning process; and you'll learn how basic educational skills can be strengthened through computer activities.

Because ATARI® microcomputers are widely used in classrooms and there is an abundance of available software for them, **BUY A SCHOOL FOR YOUR HOME** focuses on applications for ATARI computers. The authors have carefully reviewed for you (with the help of parents, teachers, and kids) selected programs.

Discover how to make learning a family affair with the home computer. Contents include:

- Increase Your Learning Power
- The ComputerKid Project
- Buyer's Guide
- Learning Basics with the Computer: Preschool
- Learning Basics with the Computer: Grades 1-3
- Learning Basics with the Computer: Grades 4-6
- Inside Arcade Games
- Adventuring on the Home Computer
- More Adventuring at Home
- The Family That Plays Together, Learns Together
- Reviews
- Appendices

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